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405 762



TM-715 040 00

Utility Program Descriptions

Milestone 11

Data Reduction Program for the Parameter

Test System

(SDRP)

1.2 April 1984

TECHNICAL MEMORANDUM

(TM Series)

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Utility Program Descriptions	SYSTEM
Milestone 11	DEVELOPMENT
Data Reduction Program for the Parameter Test System (SDRP)	CORPORATION
by Regina Frey	2500 COLORADO AVE.
22 April 1963	SANTA MONICA
Approved	CALIFORNIA
R. E. Busch	

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1.0 IDENTIFICATION1.1 TITLE

Data Reduction Program for the Parameter Test System (SDRP)
Ident: K33, Mod AA

1.2 PROGRAMMED

1 April 1963, R. Frey, System Development Corporation

1.3 DOCUMENTED

22 April 1963, R. Frey, System Development Corporation

2.0 PURPOSE

SDRP is the data reduction program for the Parameter Test System. Its purpose is to format and list on a BCD tape, or on the on-line printer, the data from the recording tape generated by the Test Control Program, STCP. All records on the tape may be listed, or records may be selected for listing through the use of Selective Listing Input Messages.

3.0 USAGE3.1 FUNCTION REQUEST

The function request used to call SDRP is:

*SDRP P_1 P_2 P_3

where:

P_1 = The input tape number. This parameter specifies the logical tape unit which contains the STCP recording tape.

P_2 = The output device. P_2 is set to either PRINTER if output is on the on-line printer, or to a logical tape number for tape output.

P_3 = Change only printing option. P_3 is set to CHANGE if change only printing is desired, or left blank if regular printing is wanted. "Change only printing" refers to the method of printing the After Core Dump Record. If change only printing is requested, then only those registers in the After Core Dump which differ in content from the same registers in the Before Core Dump are printed. If this option is omitted, the After Core Dump will be printed in the same manner as the Before Core Dump.

Restrictions:

P_1 cannot equal P_2 . Legal tape numbers are 2-12 and 16-19. If P_3 = CHANGE, then P_1 or P_2 cannot equal 4.

3.2 CONTROL DECK

The control cards needed to operate SDRP are listed below:

*CLR

*SDRP P_1 P_2 P_3

First selective listing input message deck

END

Second selective listing input message deck

END

Nth selective listing input message deck

END

Selective listing input (SLI) message decks are optional. However, SDRP expects to find at least an END message for each data file on the recording tape. Section 4.0 details the program logic used to read and utilize selective listing input messages.

If an error is found in the function call parameters, a message is printed and control is given to the typewriter for a correction. If an SLI message has an error, an error note is printed and the message is discarded.

3.3 ON-LINE PRINTER MESSAGES

On-line messages are divided between those which notify the operator of an action to be taken and those which provide information only. Messages written by COPII system subroutines are not listed.

3.3.1 Operator Messages

<u>Message</u>	<u>Program Action</u>	<u>Operator Action</u>
FIELD X OF FUNCTION CALL ILLEGAL. CORRECT ON TYPEWRITER	Hangs waiting for typewriter input.	Switch typewriter to lower case and type in a one-field mes- sage which will correct the error.
SDRP UNABLE TO RECOGNIZE INPUT TAPE. CORRECT TAPE REEL AND PRESS START	Program halts.	The correct tape should be mounted. Continue from point of interrup- tion.
CARD READER NOT READY. INSERT MESSAGE VIA TYPEWRITER	Program hangs waiting for typewriter input.	Shift typewriter to lower case and type in one SLI message. Also ready reader, if appro- priate.
EOT READ. CHANGE INPUT TAPE AND PRESS START	Tape is rewound with interlock and program halts.	Change tape on input unit and continue from point of interruption.
PHYSICAL EOT DETECTED ON OUTPUT TAPE. CHANGE TAPE	Program writes an EOF on the output tape and halts.	Place new blank on output tape unit and continue from point of interruption.
INOPERATIVE OUTPUT EQUIPMENT SPECIFIED. CORRECT IF POSSIBLE AND HIT START	Program halts.	If possible, ready equipment. Otherwise, pull job.

3.3.2 Information Messages

<u>Message</u>	<u>Program Action</u>
INPUT TAPE PARITY ERROR	If the record which caused the parity error was a data record, it is rejected. Otherwise, the program attempts to use it anyway.
OUTPUT ERROR X	This message is printed if an error occurs while writing a BCD data message. X = the error number generated by OUTPUT. Program continues from point of interruption.
CARD INPUT ERROR X	This message is printed if an error occurs while reading SLI card messages. X = the error number generated by INPUT. No special action taken.
BINARY SCRATCH TAPE PARITY ERROR	A parity error occurred while reading, or writing, the SDRP scratch tape. No special action taken.
BINARY SCRATCH TAPE BUFFER LENGTH ERROR	A buffer length error occurred while reading, or writing, the SDRP scratch tape. No special action taken.
SELECTIVE LISTING INPUT TABLE CAPACITY EXCEEDED. NO MORE INPUTS WILL BE RECOGNIZED.	SDRP discontinues reading SLI messages for that data file.
SDRP OPERATION COMPLETED. PLEASE LIST LOGICAL TAPE XX	Termination message. Program exits to MTCII. If output is on the printer, the second half of the message is not printed.

3.4 TAPE ASSIGNMENTS

To operate SDRP, assign tapes as follows:

Tape Unit 1: System Utility Master
Tape Unit 3: System Output
Tape Unit 4: SDRP Scratch Tape
Tape Unit X: STCP Recording Tape
Tape Unit Y: SDRP Output Tape, if applicable

If change only printing is not requested, or the Before Core Dump consists of only one record, the scratch tape is not required. At the end of the run, SDRP writes an EOT on the output tape and rewinds both the recording tape and the output tape with interlock.

3.5 TEST RECORDING TAPE

The data input to SDRP is contained on the Test Recording Tape produced by the Test Control Program, STCP. This tape is organized into data files. There is one data file for each operation of the object program.

A file is organized as follows: Table and Item Dictionary, Test Recording Table, and data records. The Table and Item Dictionary contains information on tables and items defined as the object program's environment. The Test Recording Table contains the RECORD messages read by STCP. The first two words of most data records contain identification and processing information. Statements 5 and 6, below, describe the data records that are the exceptions. Formats of all the records can be found in Appendix A.

Other characteristics of the tape are:

1. The third record of the first file is a Before Core Dump Record.
2. If an After Core Dump record is found on the tape, no more data records will follow.
3. The end of meaningful data is signaled by a double EOF mark.
4. A physical EOT is designated by a two-word Continue Record. The first word of the record is a BCD "CONTINUE".
5. If a core recording exceeds the maximum record length, it will be broken up into two or more records. However, only the first record will have identification data as its first two words.
6. A Trace recording consists of a series of BCD coded records terminated by an EOF mark. The first record contains a one-word

identification and is 16 words long. All other records in the series have no identification word, and are 15 words long.

3.6 SELECTIVE LISTING INPUT MESSAGES (SLI)

3.6.1 Input Method

SLI messages are input to SDRP via either the card reader or the console typewriter. Their format and input method are the same as MTCII free field control messages with the exception that, if the typewriter is used, no asterisk is typed and the typewriter must be shifted manually to lower case.

First, the card reader is checked and SLI messages are read until either a termination message is found or until the reader becomes not ready. If the reader becomes not ready, control is given to the typewriter for the next message. After processing that message, the card reader is checked again. The program returns to the typewriter only if the card reader is still not ready. Typewriter message formats are the same as card message formats and each message is terminated by a carriage return.

3.6.2 Message Formats

There are four possible types of SLI messages. Their formats are exactly the same as the RECORD message formats accepted by STCP. Therefore, a card message can be used as input for either program.

The last two fields of each message provide a means for selectively choosing records of a specific "during" recording for processing. This option might be used, for example, when a trap in an object program loop causes a table to be recorded many times.

All address and numerical values may be either octal or decimal, unless specifically stated otherwise. All octal values must be terminated by a "B".

3.6.2.1 Table or Item Message

- Field 1 = RECORD
- 2 = name of the table or item, not to exceed 8 characters.
- 3 = the object program name associated with a relative address in field 4. Equal to zero if field 4 is an absolute address, or if the option is not used.
- 4 = the trap address for a "during" recording. It may be
- 1) a relative address in the object program.
- 2) an absolute address.
- 3) zero for no "during" recording.
- 5 = "before" and "after" recording indicators. May be equal to B, A, BA, AB, or zero.
- 6 = the starting record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.
- 7 = the last record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.

3.6.2.2 Core Memory Dump Message

- Field 1 = RECORD
- 2 = name of the table or item, not to exceed 8 characters.
- 3 = the object program name associated with a relative address in field 4. Equal to zero if field 4 is an absolute address, or if the option is not used.
- 4 = the trap address for a "during" recording. It may be
- 1) a relative address in the object program.
- 2) an absolute address.
- 3) zero for no "during" recording.
- 5 = "before" and "after" recording indicators. May be equal to B, A, BA, AB, or zero.

- 6 = the number of words to be recorded. This field is not used by SDRP and may be zero unless the message is intended as input for STCP.
- 7 = the object program name in which the memory dump will start. For relocatable addresses in field 8. Equal to zero if field 8 is absolute.
- 8 = the core address of the first word of the dump. May be relative or absolute.
- 9 = the starting record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.
- 10 = the last record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.

3.6.2.3 Reference Pool Message

- Field 1 = RECORD
- 2 = POOL if the pre-Augmentation reference pool is recorded or POOLA if the Augmentation reference pool is recorded.
- 3 = the object program name associated with a relative address in field 4. Equal to zero if field 4 is an absolute address or if the option is not used.
- 4 = the trap address of a "during" recording. It may be
 - 1) a relative address in the object program.
 - 2) an absolute address.
 - 3) zero for no "during" recording.
- 5 = "before" and "after" recording indicators. May be equal to B, A, BA, AB, or zero.
- 6 = the absolute octal starting address in the reference pool for recording.
- 7 = the number of reference pool words to be recorded. Not used by SDRP. May be zero unless the message is intended as input for STCP.

- 8 = the starting record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.
- 9 = the last record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.

3.6.2.4 Console Message

- Field 1 = RECORD
- 2 = CONSOLE
- 3 = the object program name associated with a relative address in field 4. Equal to zero if field B is an absolute address or if the option is not used.
- 4 = the trap address of a "during" recording. It may be
 - 1) a relative address in the object program.
 - 2) an absolute address.
 - 3) zero for no "during" recording.
- 5 = "before" and "after" recording indicators. May be equal to B, A, AB, BA, or zero.
- 6 = the starting record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.
- 7 = the last record of this "during" entry to be processed. Equal to zero, or blank, if all records are processed.

3.6.2.5 Termination Message

- Field 1 = END

3.7 PROGRAM OUTPUT

3.7.1 General Description

SDRP writes its BCD information either on the on-line printer or on a listable tape. The method of output is specified through the function call message.

The first recording printed is the Before Core Recording. Then each data file is printed as a unit of information. Following all of the data files, the After Core Recording is written (if there is one), and the job is terminated.

For each data file, the file number is printed and the Selective Listing Input messages are written along with the Termination message. Data records follow.

3.7.2 Data Description

There are five types of output data: core dumps, trace records, reference pool records, console records, and internal table and item records. Each type of output data is prefaced on the printout by a heading line. The heading line indicates the type of data and when the data was recorded -- before, after, or during.

3.7.2.1 Core Records (CORE)

Four binary words are converted and printed per line. If a four-word line (with the exception of the last line) contains all zeros, its printing is suppressed. Operation codes are translated to mnemonic characters in the Before, After and HCore Core Records, but are left as octal numbers in all other cases. The range of the recording is printed at the end, giving inclusive addresses. A message is also printed if Change Only Printing is used for the After Core Recording.

3.7.2.2 Trace Records (TRACE)

Trace records exist on the recording tape in BCD form and require no processing by SDRP. Records are read and printed until an EOF is detected.

3.7.2.3 Reference Pool Records (POOL, POOLA)

Two dictionaries are used to reduce reference pool records: one for the Augmentation pool, and one for the pre-Augmentation pool. Using the

starting core address of the recording, the appropriate dictionary is searched for a matching address. The name of the table or item corresponding to that address is printed along with the values contained in its entries. If the dictionary entry is a table (i.e., the length is greater than one), table entry numbers are printed immediately preceding the contents of the entry. After the entire table has been reduced, the address of the next word in the binary record is used as the starting core address for a further search of the dictionary. If, at any time, the starting core address is not found in the dictionary, the record is printed as an octal core dump.

3.7.2.4 Console Record (CONSOLE)

The contents of the record are printed in a fixed format. Appendix A details the contents of the record.

3.7.2.5 Internal Table and Item Records (NAME)

This type of recording is processed in a manner similar to the reference pool records. The Table and Item Dictionary is used to determine the characteristics of the table.

A teletype or typewriter coded table is converted to BCD code and printed in such a way that a slash (/) immediately precedes the left-most character of each data word. Print positions are filled. No blanks are left between words. Twelve table words can be written per line.

3.7.2.6 Inactivity Records

As a result of an inactivity in the object program, STCP will generate Console, Core and Trace records. These binary records have the same format as requested records, except that the first character of the identification word is a BCD "H" (i.e., HCONSOLE, HCORE and HTRACE). The "H" identification is placed on the printout, and the records are reduced in the normal manner.

3.7.3 Information Messages

- | | |
|---|---|
| 1. SELECTIVE LISTING INPUT
MESSAGES LISTED BELOW | Printed at the beginning of each data file. All SLI messages, whether from card reader or typewriter, are listed. |
| 2. ILLEGAL FIELD ON
FOLLOWING MESSAGE | This message is written whenever the program is unable to process a field on an SLI message. The entire message is rejected and will not be used for record processing. |
| 3. ONLY CHANGED LOCATIONS
WERE PRINTED | Printed immediately following the After Core Dump output if Change Only Printing was used. |
| 4. STARTING ADDRESS OF
REFERENCE POOL TABLE NOT
FOUND IN DICTIONARY.
RECORD IS DUMPED IN OCTAL | Printed at any point at which the program cannot find the starting address in the dictionary. Remainder of record printed in same manner as CORE records. |

4.0 METHOD

SDRP begins operation by reading the function request parameters and modifying itself as required. The initial Table and Item Directory and Test Recording Table are read from the recording tape, and the Before Core Dump Recording is read and processed.

At this point, the program is ready to process data files. As outlined in Section 3.5, the binary records on the input recording tape are grouped into data files. SDRP is designed to process any number of these files, each independently of the others.

For each file, the program must know whether to use the Test Recording Table or a table built from SLI messages. The card reader and/or typewriter are checked for messages. If at least one SLI message is found, then a table is constructed and only those records in the file which correspond to SLI messages are processed. If no SLI messages are read, but only an END message, then all records of the file are reduced according to the Test Recording Table.

An EOF mark signals the end of a data file. A new Table and Item Directory, a new Test Recording Table, and new SLI messages are read. All traces of the former file are erased.

As a data record is read, its identification word is checked to see whether it is an inactivity record (first character of word is an "H"), or a TRACE record. If so, the record is reduced without any reference to a possible SLI entry. In other words, the record is reduced automatically without any selective option.

A core dump recording whose length exceeds the maximum record length is broken up into a group of two or more records by STCP. An indicator in the second word of the initial record signals that more records are to follow. SDRP reads records until the entire core recording is processed.

Change Only Printing requires that the Before Core Dump be saved for comparison with the After Core Dump. If the Before Core Dump exceeds one record in length, the excess records are written on a scratch tape until the time when they will be needed again.

SDRP operation is terminated when either an After Core Dump record is read or a double EOF mark is found. This could occur after only one data file or after several files.

5.0 RESTRICTIONS AND ACCURACIES

1. The STCP recording tape is not rewound before reading the first record.
2. Only 100₁₀ Selective Listing Input messages can be accepted for any one data file.
3. There is no limitation on the length of core requests. However, internal table requests cannot exceed 4998 words each.

4. SDRP at present is programmed to reduce two specific reference pools. They are the Augmentation and pre-Augmentation reference pools found on the ASUM and SUM masters, respectively. To allow reduction of any other reference pool, a dictionary would have to be added to the program's environment.
5. Note that SDRP uses tape unit 4 as a scratch tape when Change Only Printing is requested. A blank tape need not be assigned to the unit if Change Only Printing is not requested or if the Before Core Dump Recording is only one record.
6. SDRP is unable to process relative trap and dump addresses. If an address on an SLI message is given in absolute form, it will be matched with the equivalent addresses in the Test Recording Table and in the data records. Otherwise, the parameter is set to zero in the SLI table and is ignored when data records are chosen for processing.

6.0 TIMING

The reduction of a tape containing five files with 143 records onto a listable tape required approximately 1.5 minutes, including time to read SLI messages.

The total number of time needed for one job will depend upon the number of data files, the length and number of records in each file, the methods of input and output, and the number of SLI messages read.

7.0 STORAGE REQUIREMENTS

Program Instructions	1444 ₈	or	804 ₁₀
Storage and Constants	27430 ₈	or	12056 ₁₀
COPII Subroutines	<u>2203₈</u>	or	<u>1155₁₀</u>
Total Cells:	33277 ₈	or	14015 ₁₀

8.0 SUBROUTINES USED

Those COPII subroutines used by SDRP are EOT, FFCONV, INFLEX, INPUT, OUTERR, OUTPUT, and TAPEIO. SDRP also references the communication cells EXITSTAT, IOBUFWD, and IOSTATUS.

9.0 VALIDATION TESTS

SDRP's functions have been validated through the successful reduction of seven recording tapes. Two tapes were generated by special programs written by the author. These programs wrote binary records from preset data images in a predetermined sequence. The first tape contained one file of information and served to "get the program going". The second tape was actually two tapes with two files of data and a Continue record on the first and one file of data on the second. Included in both tests were multiple record Core recordings.

The other five recording tapes were generated by STCP and aided, among other functions, to checkout STCP-SDRP communication. One tape was a five-file recording tape. Inactivity records and Trace records were mixed with numerous Internal Table, Pool, Console and Core records.

The function request and SLI cards used to reduce these tapes are listed in Appendix B. Also, many runs were made with only an END message. A description of SDRP output is given in Section 3.7. A sample output can be found in Reference 3.

Procedures used were those associated with the operation of the program by itself, without prior operation of STCP. The most common procedure was to use card SLI inputs and tape output. However, typewriter input and printer output were also tested.

SDRP has been operated successfully on top of itself; i.e., without first clearing core. SDRP has been tested as a part of a complete run of the Parameter Test System by operating the program immediately after the operation of STCP.

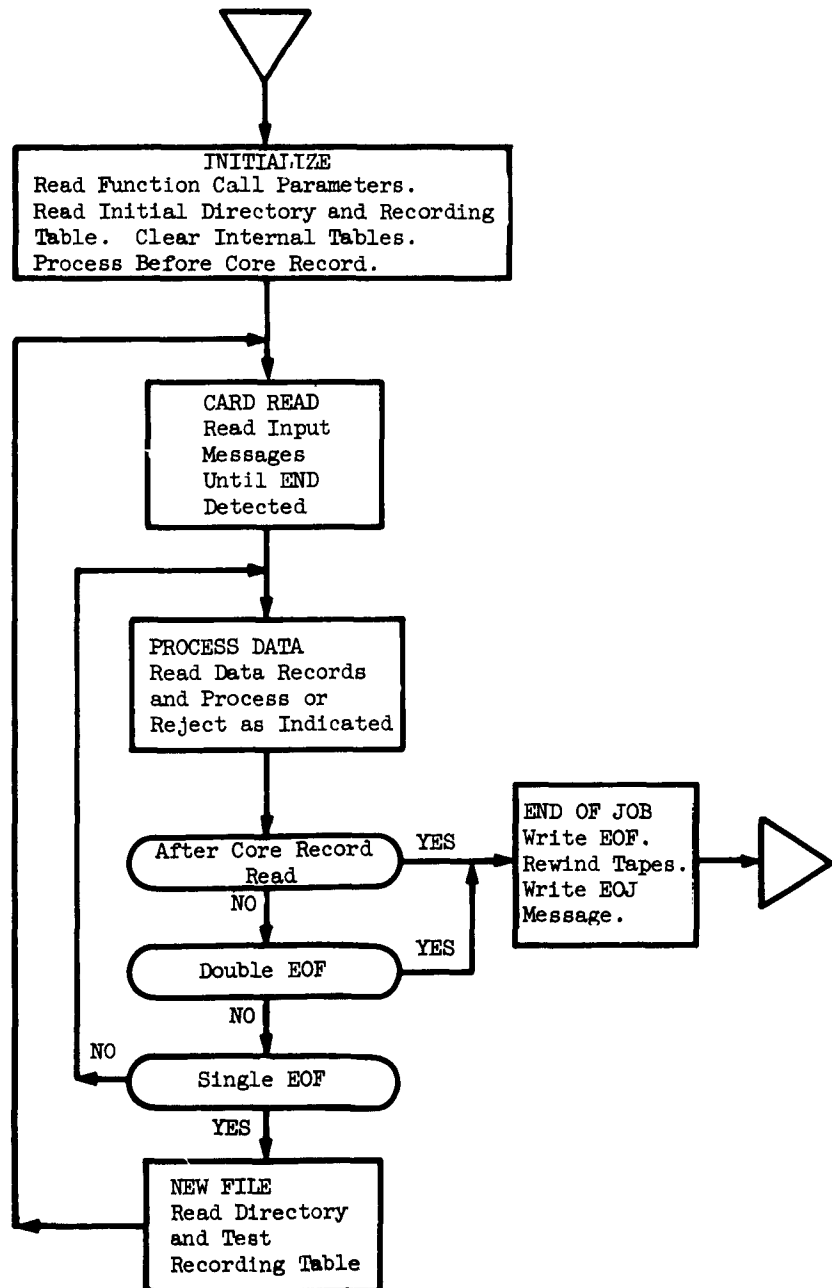
10.0 REFERENCES

1. AFCPL Catalogue Number for SDRP: 75933.
2. TM-891/003/00, Computer Program Design Specifications for the Parameter Test System, Milestone 4, 1 February 1963.
3. TM-1073/000/00, Operating Instructions for the Parameter Test System, Milestone 7, 25 March 1963.
4. TM-715/039/00, Utility Program Descriptions, Reference Pool Simulator Program (SRPS), Milestone 11, 22 February 1963.
5. TM-715/041/00, Utility Program Descriptions, Parameter Test Control Program (STCP), Milestone 11, 25 April 1963.

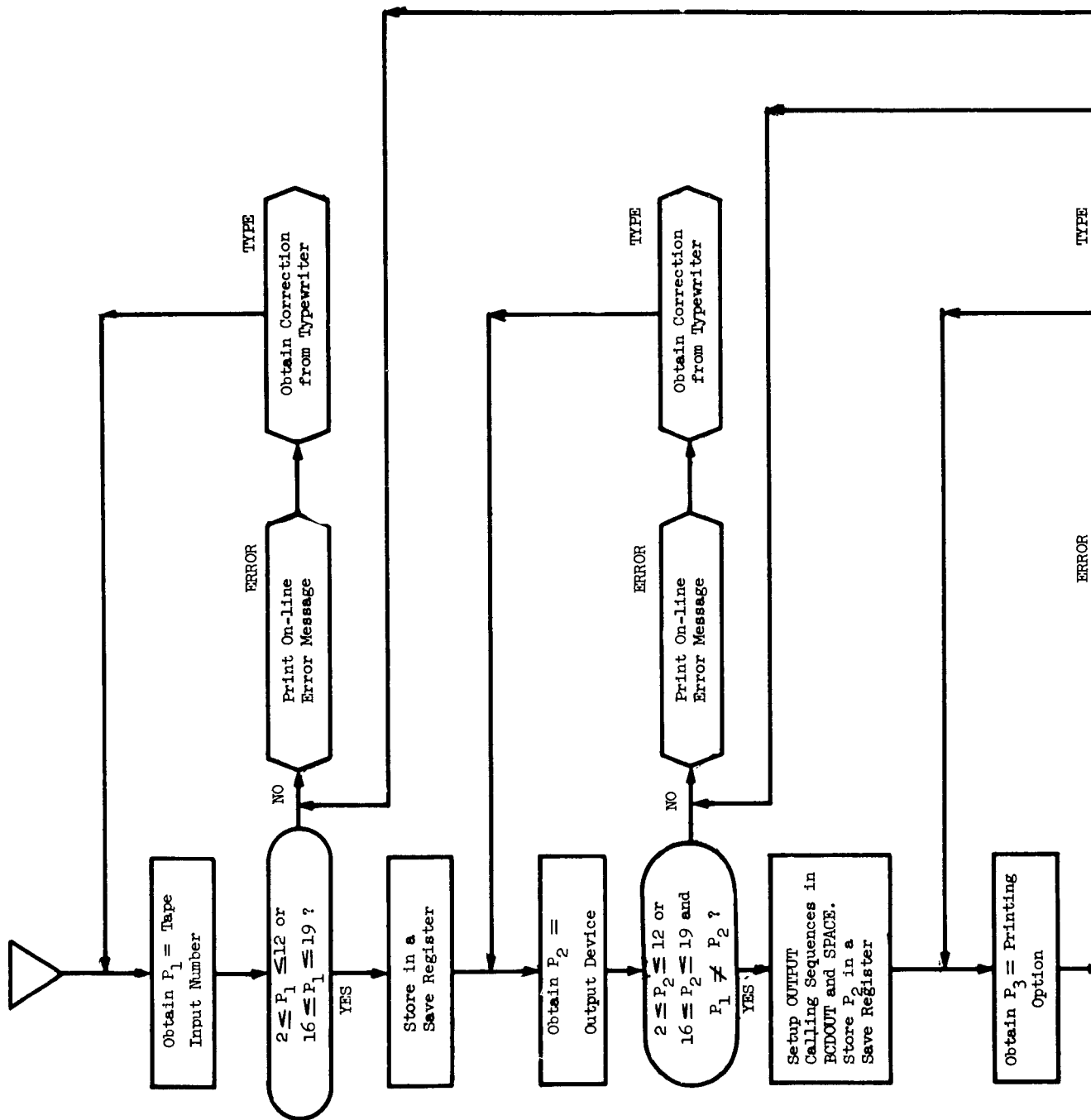
11.0 FLOW CHARTS

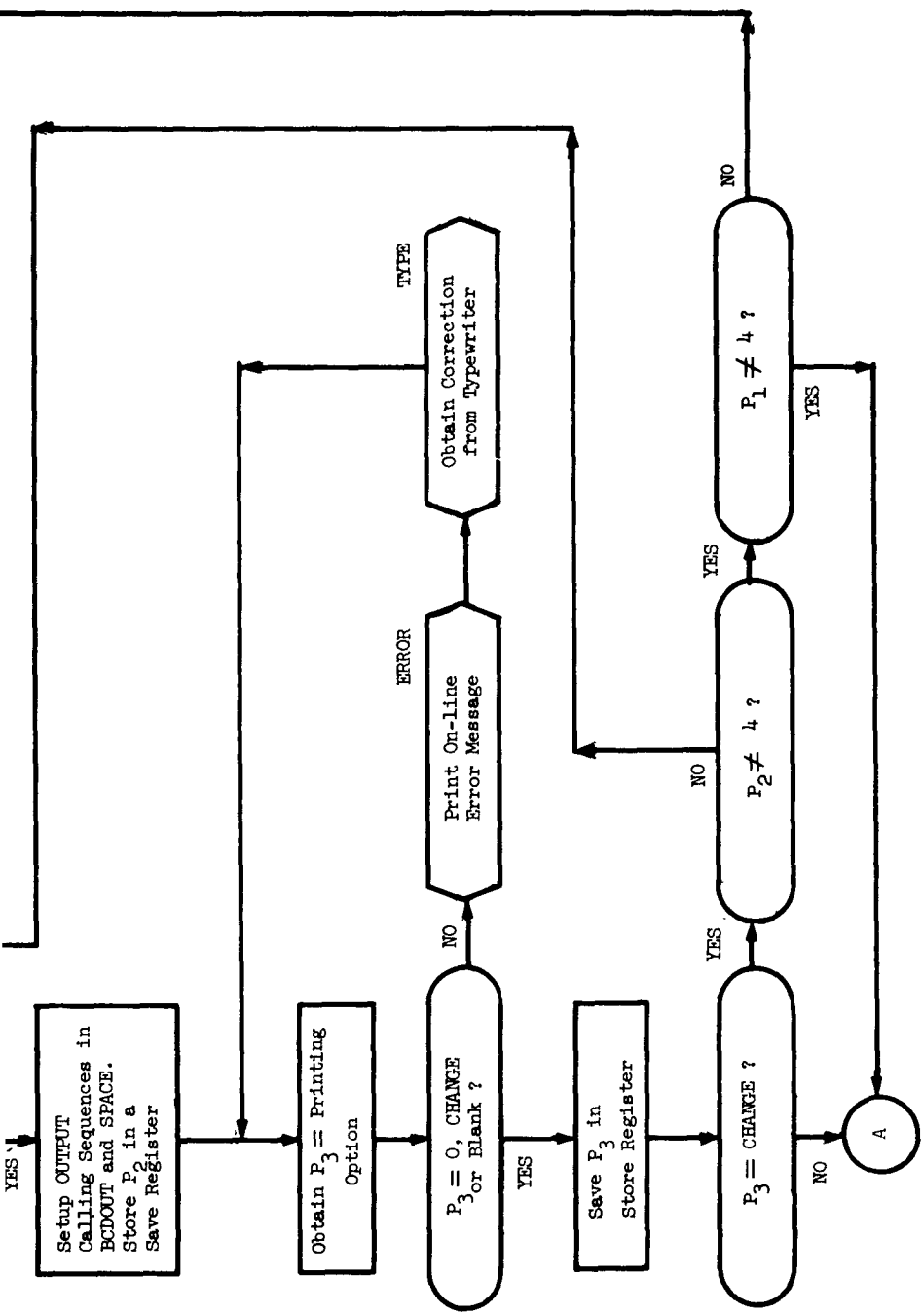
<u>Routine</u>	<u>Page</u>
SDRP Program Flow	17
BCDOUT	25
BEGIN	18
CARD	20
CLEAR	26
CONSOL	27
CORE	29
ERROR	38
HEADING	39
LINE	40
POOL	41
PROCES	22
READ	49
SPACE	50
TABLE	51
TELTYP	46
TRACE	52
TYPE	50
UNPACK	53

SDRP Program Flow

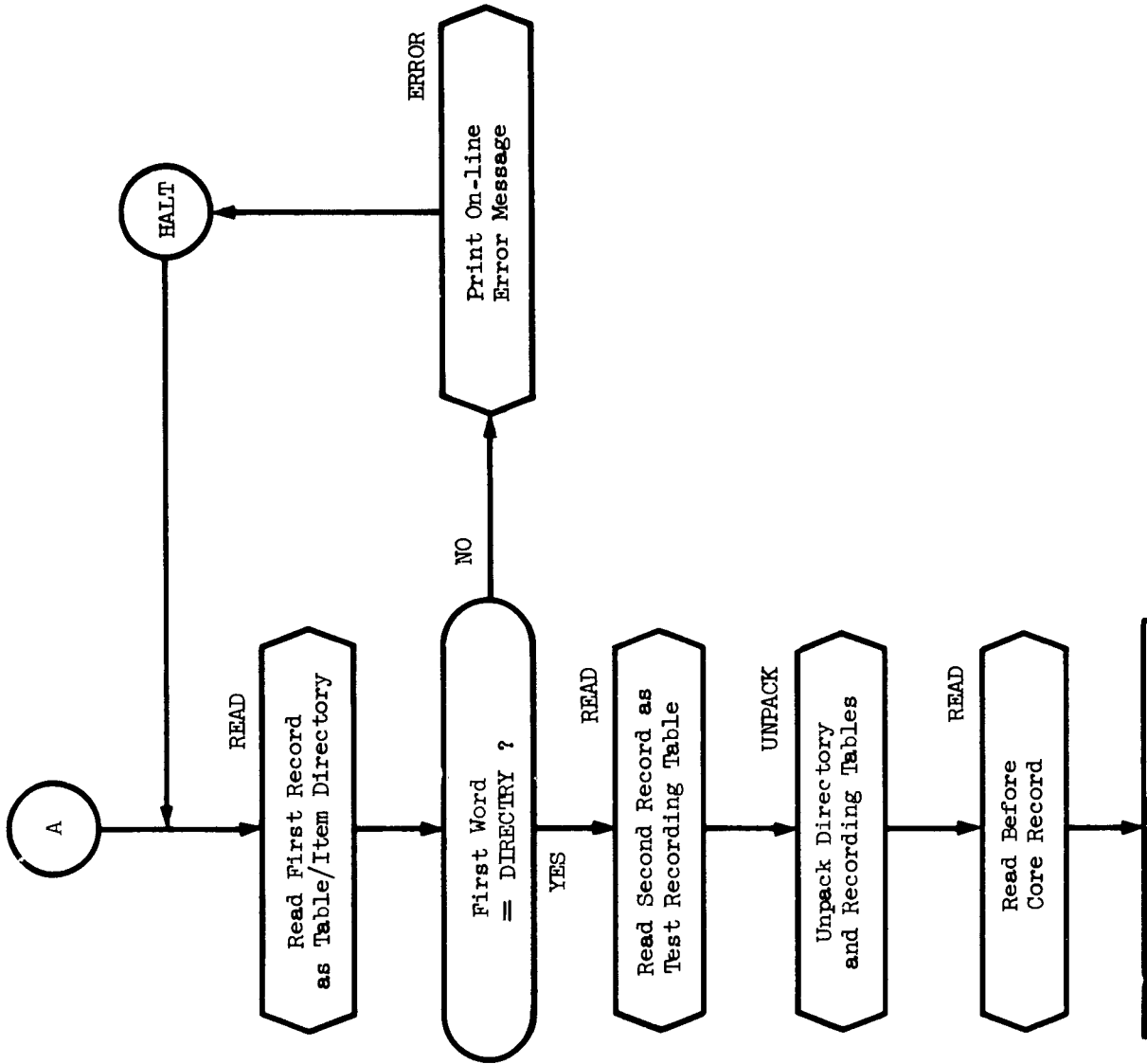


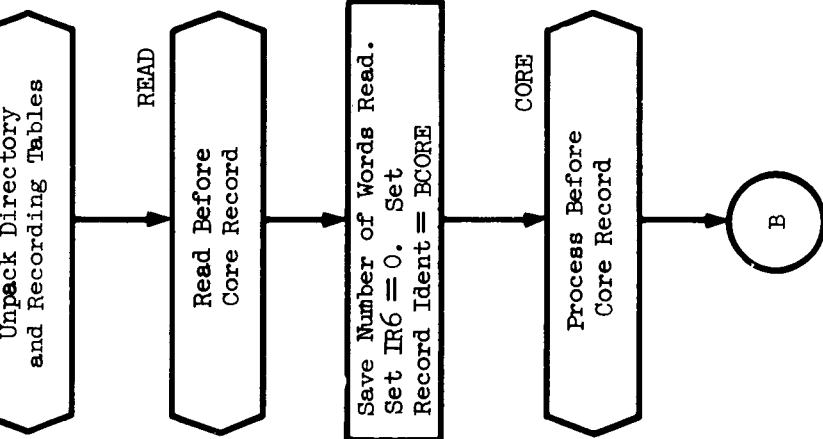
BEGIN
Initialization Routine
Get Function Call Parameters





BEGIN (Continued)
Read First Three Records of
Input Tape



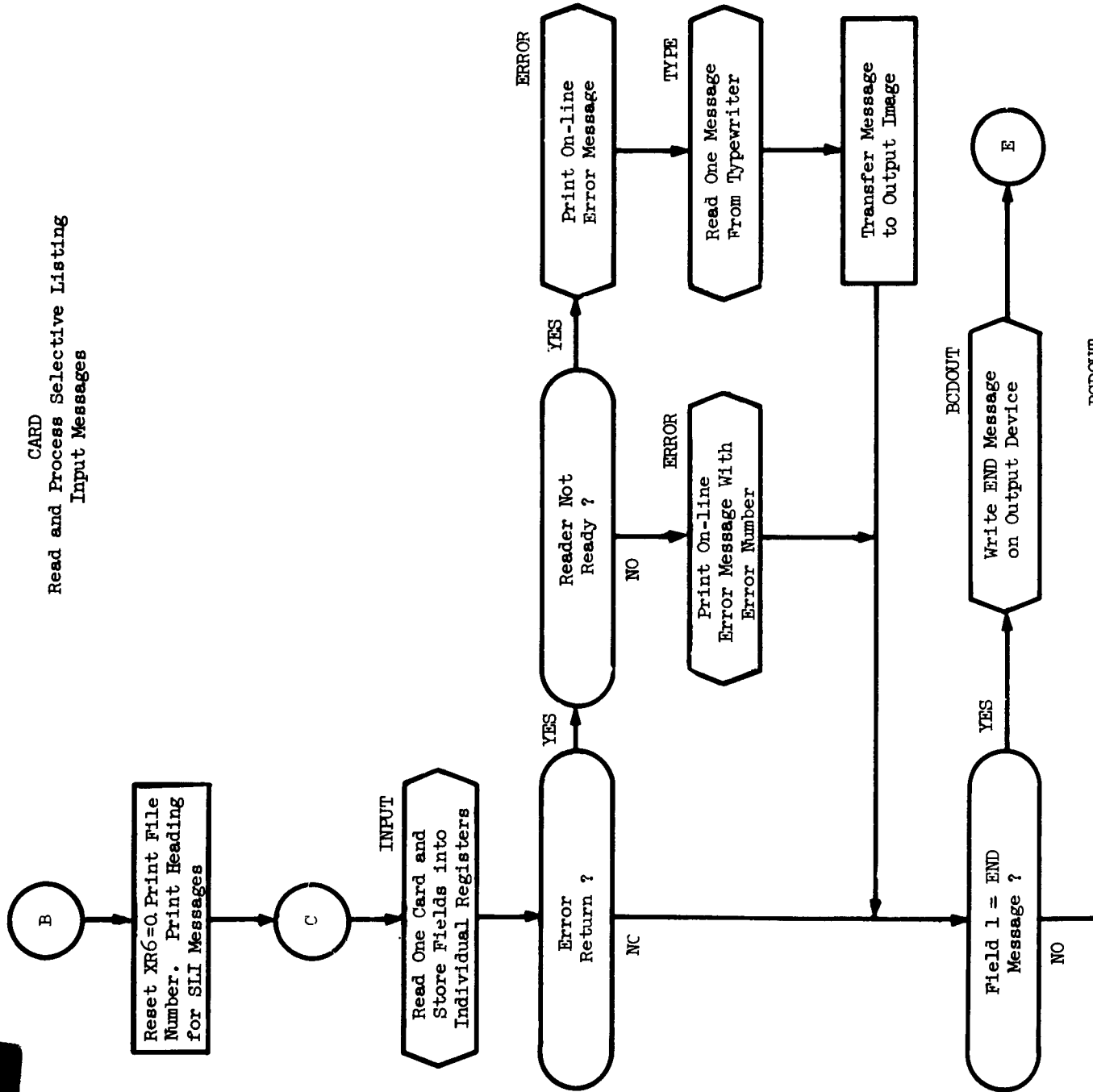


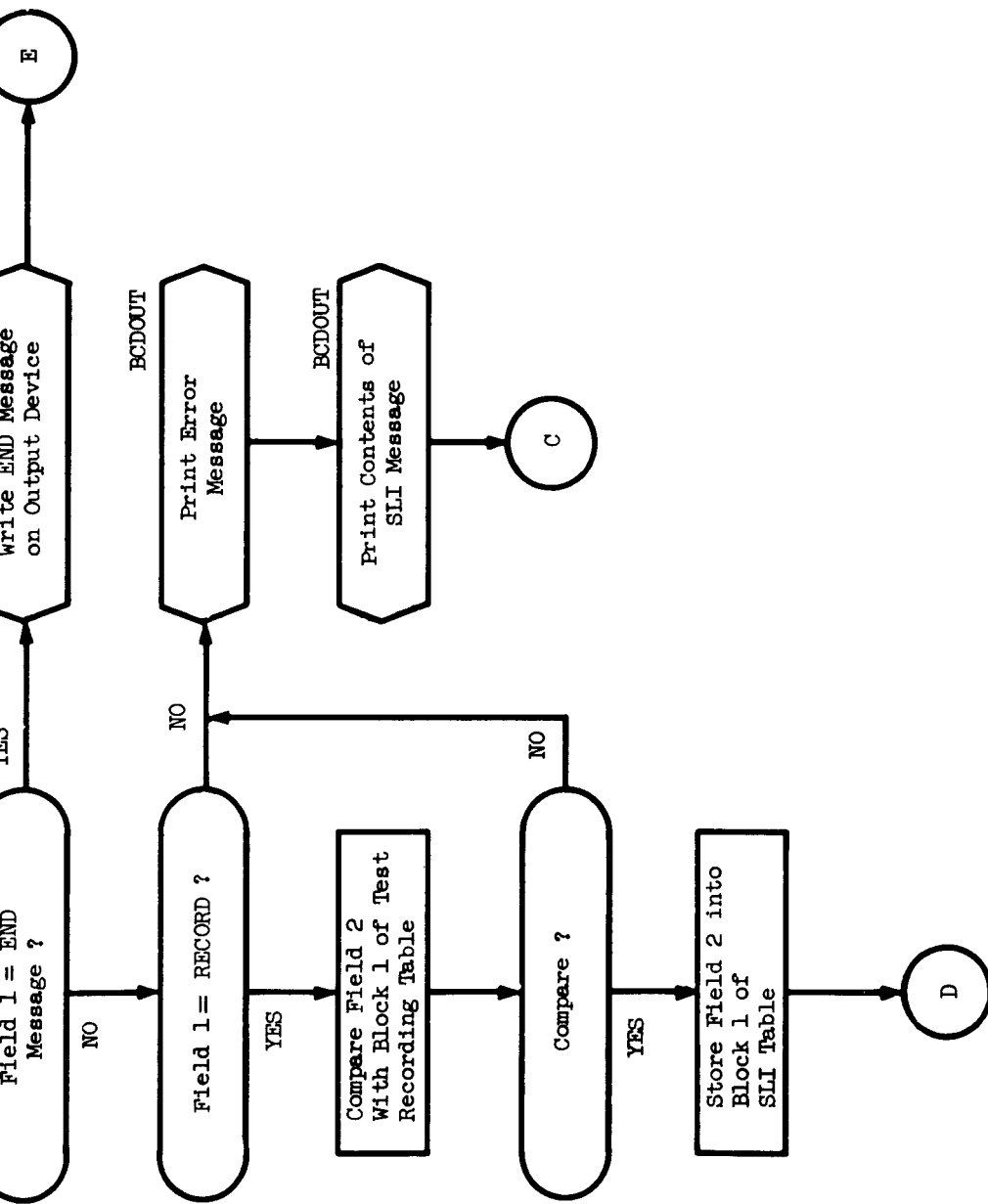
22 April 1963

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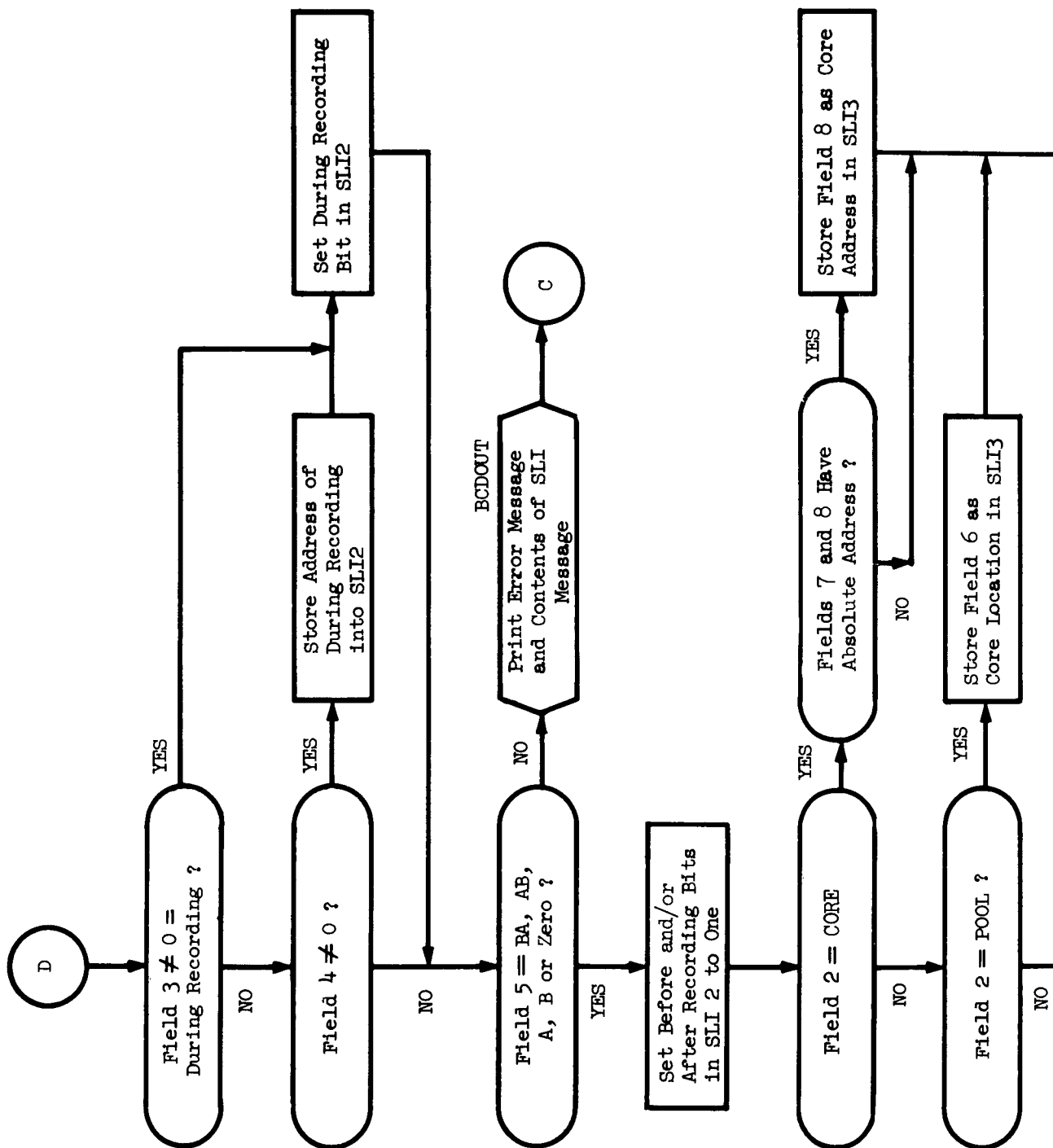
TM-715/040/00

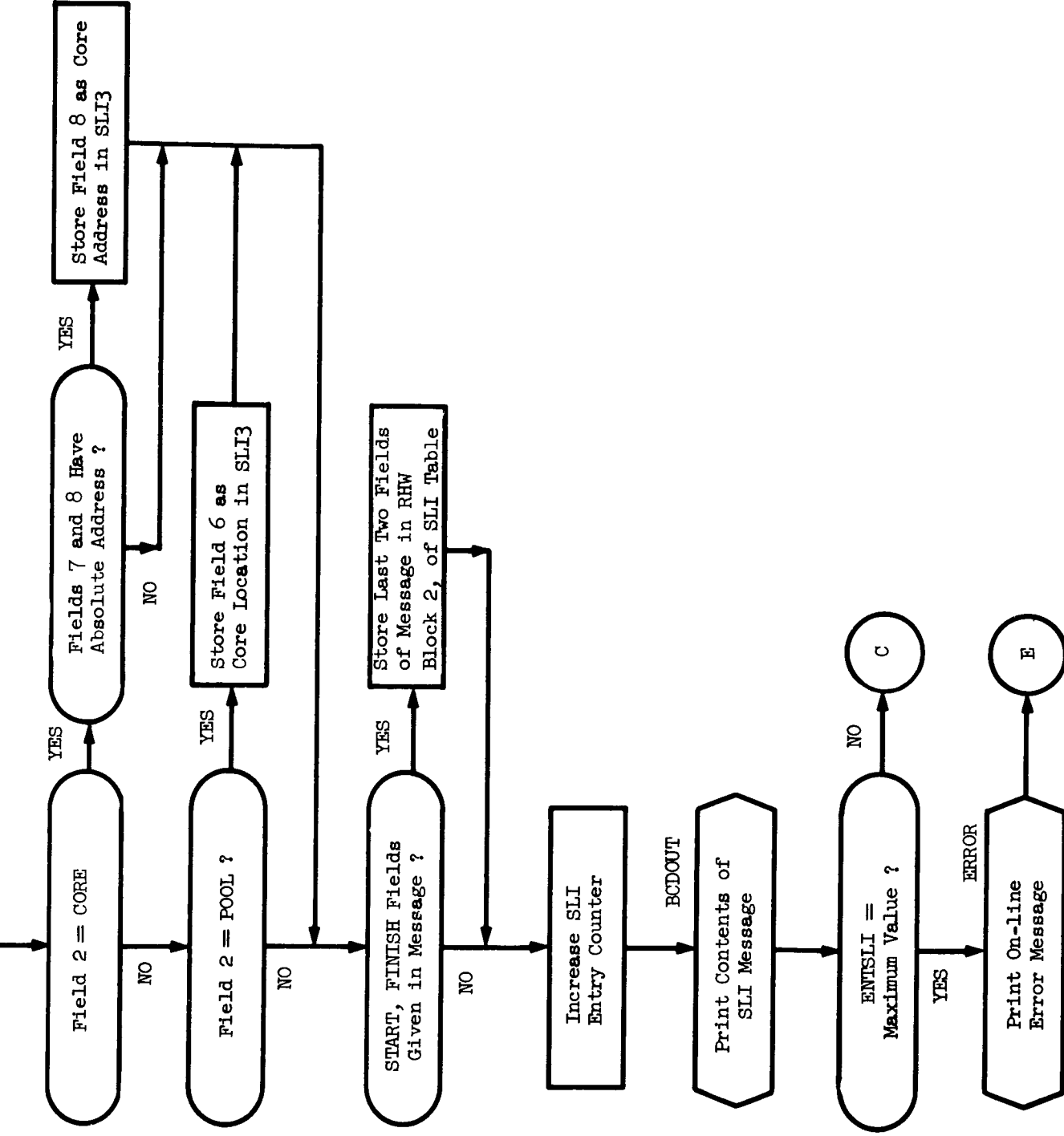
CARD
Read and Process Selective Listing
Input Messages





CARD (Continued)

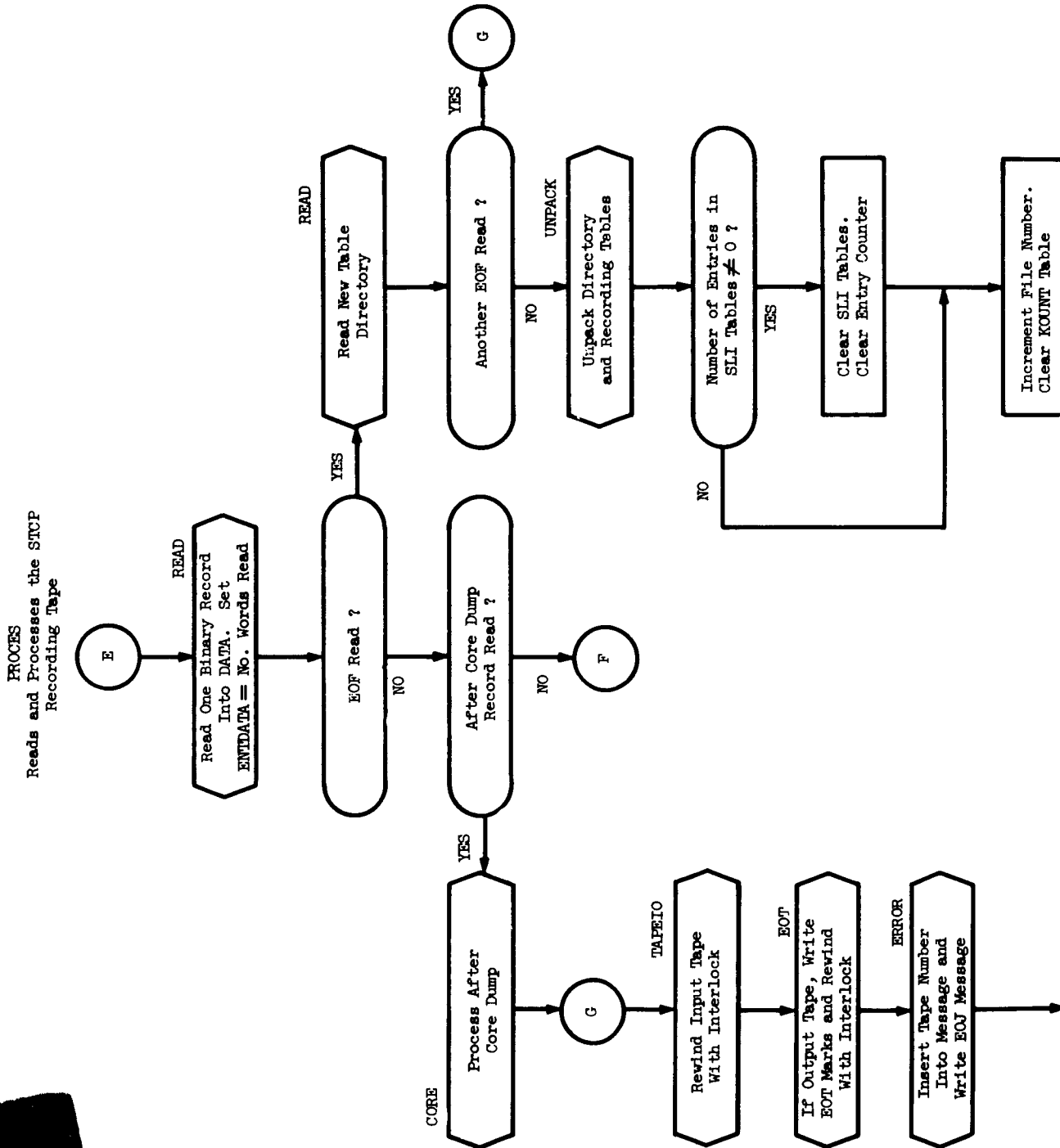


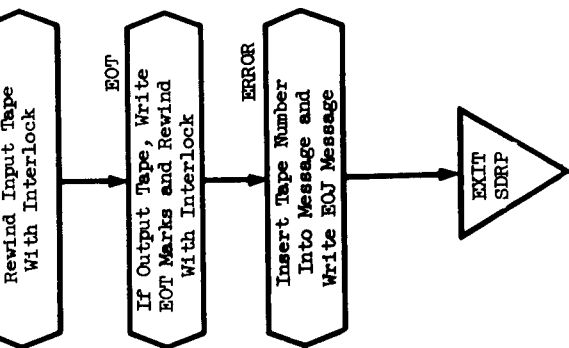
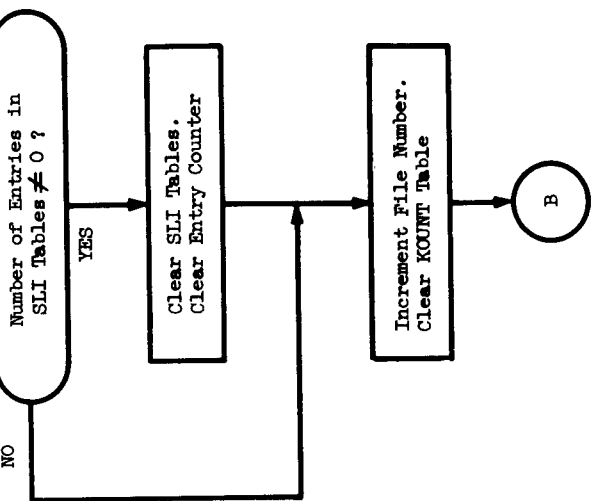


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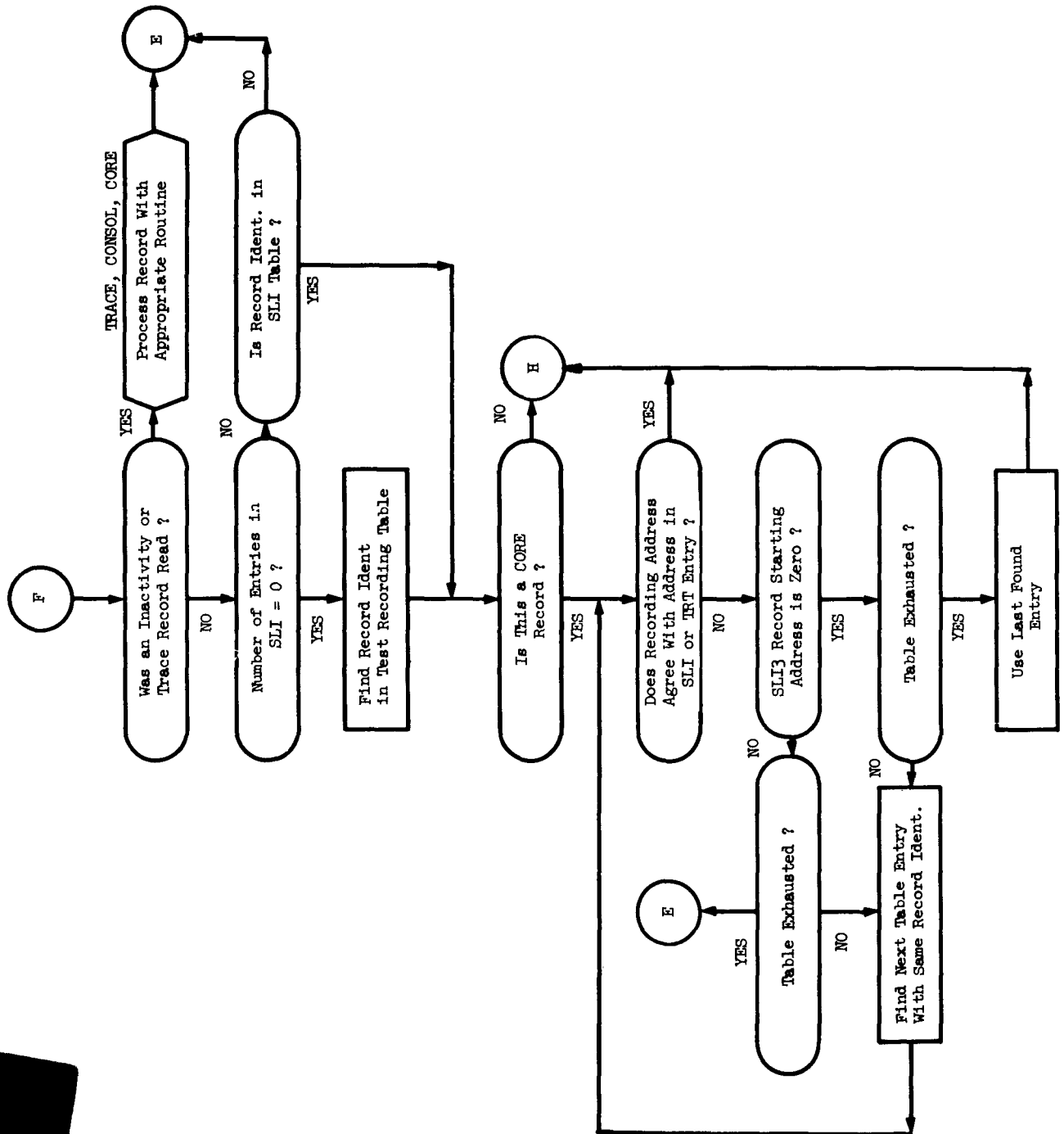
- 22 -

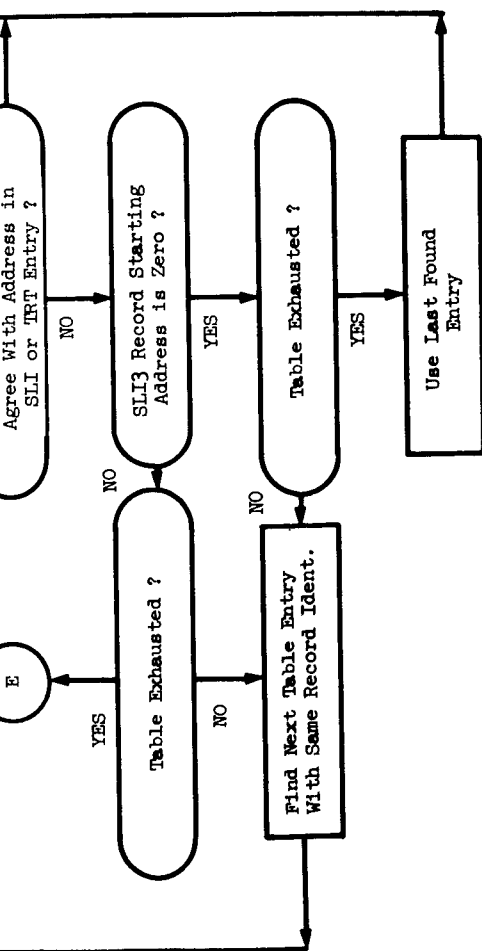
TM-715/040/00





PROCES (Continued)



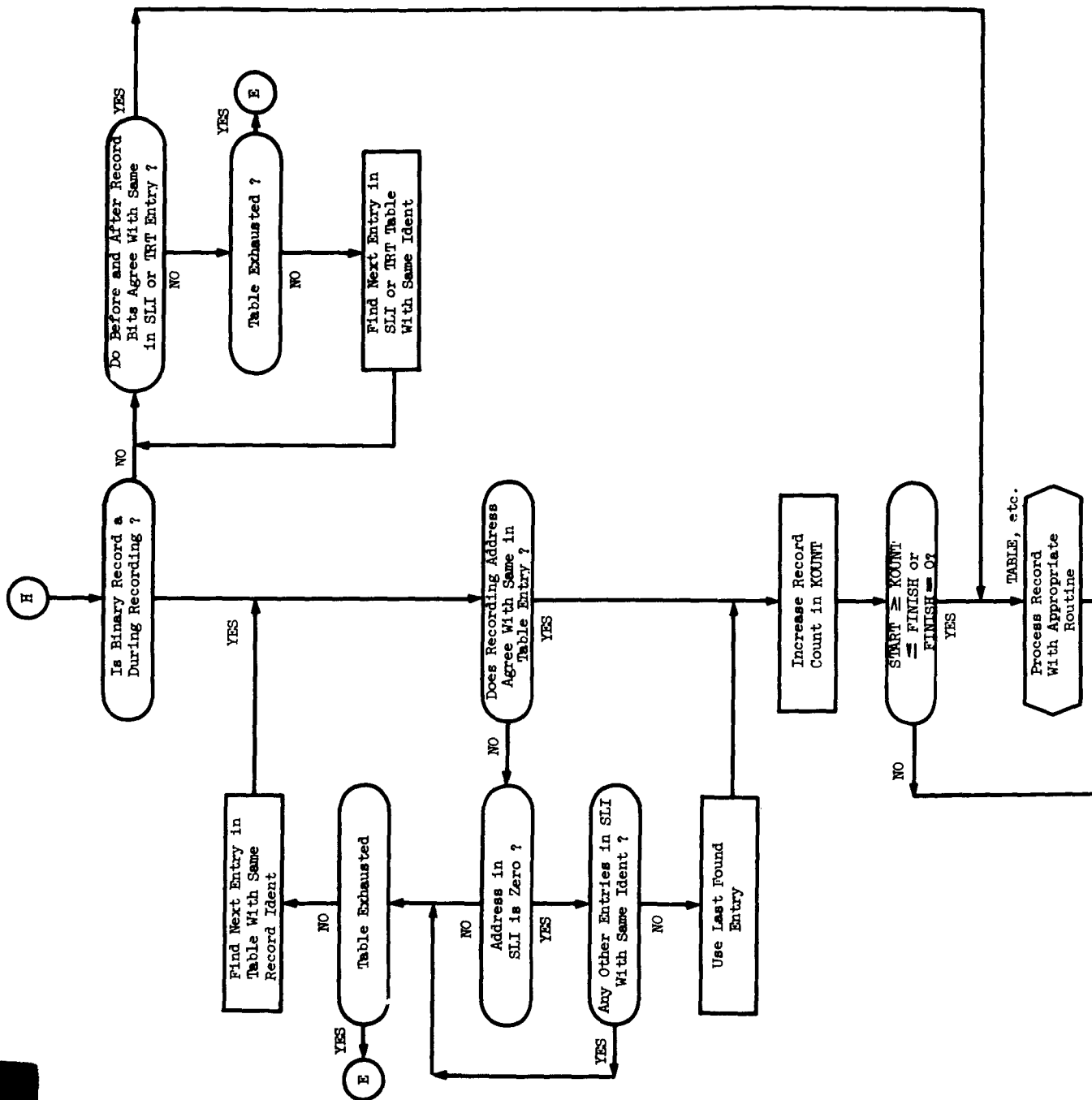


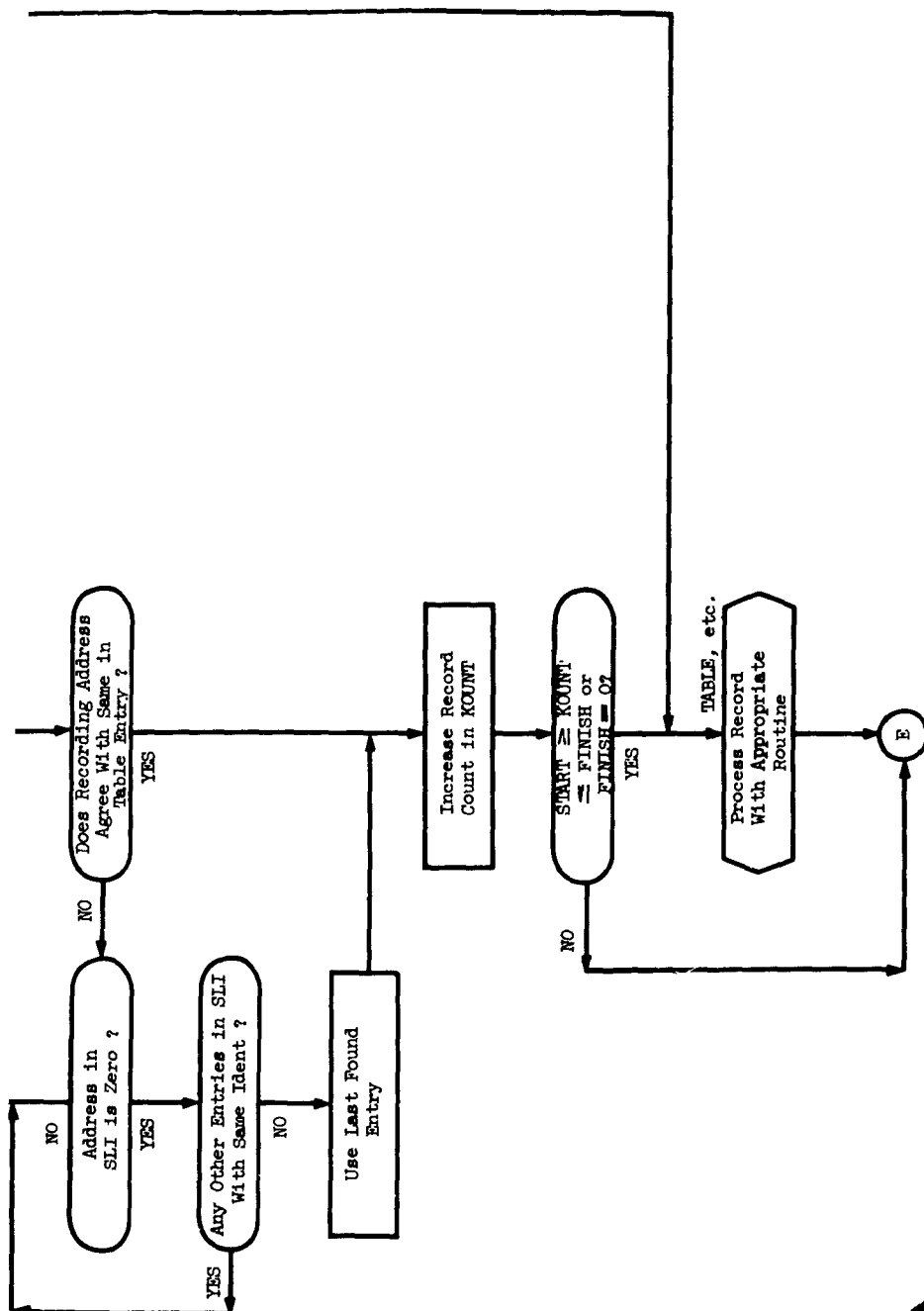
22 April 1963

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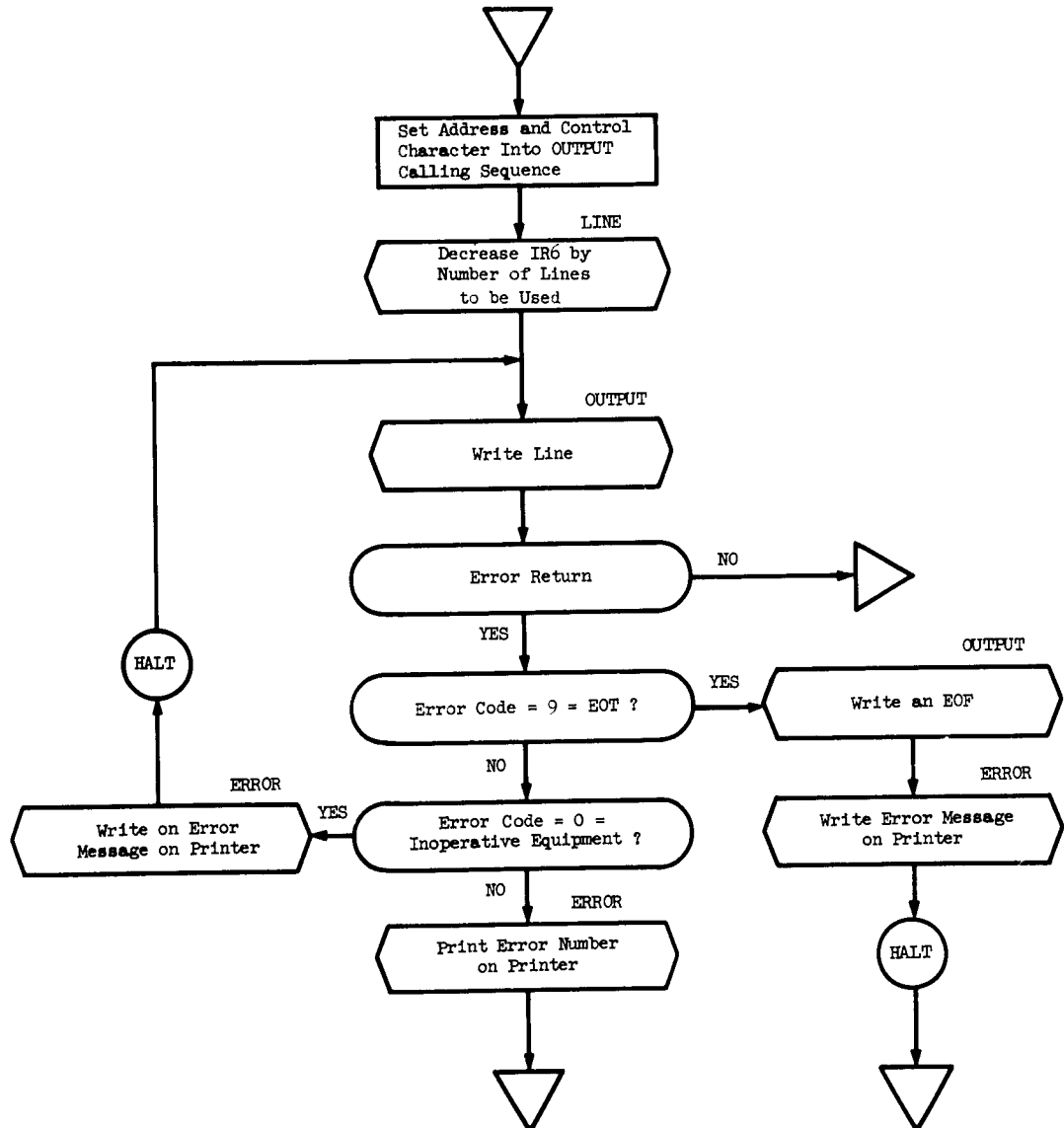
PROCES (Continued)





BCDOUT

Writes One Line of BCD Coded Data
on the Designated Device. Enter With
A = Address of 15 - Word Output Image
and Q = Control Character.



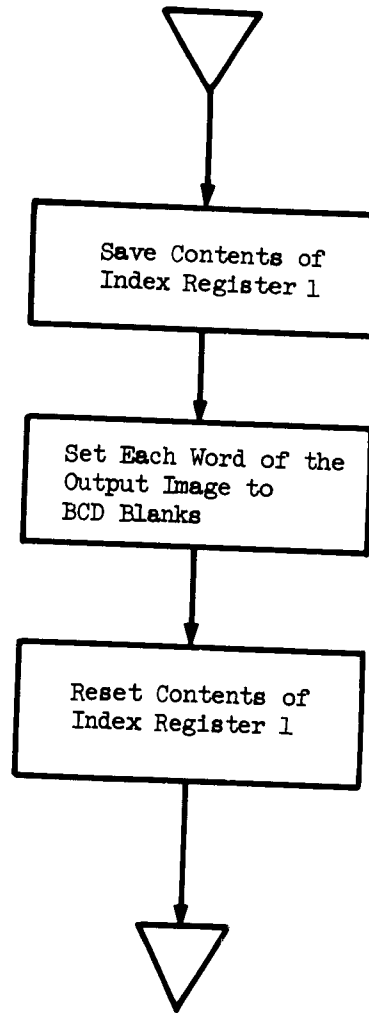
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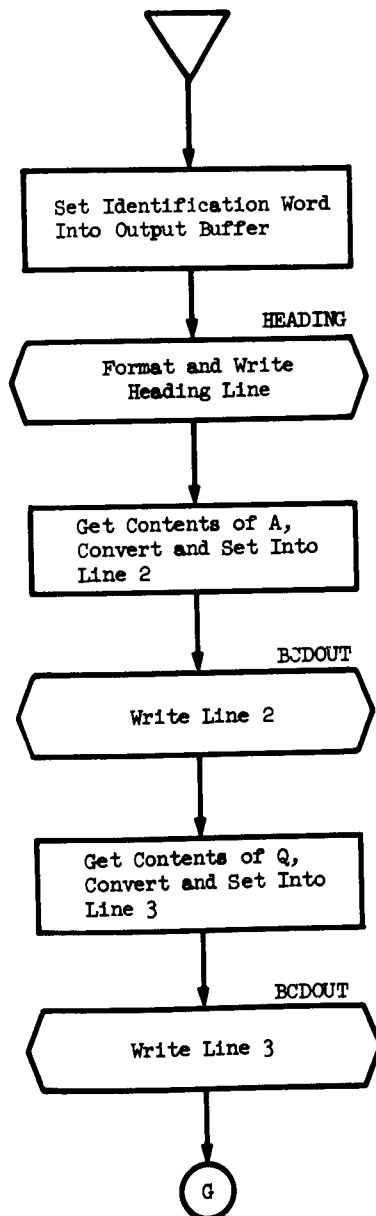
CLEAR

Sets the 15 Word Output Image to
BCD Blanks

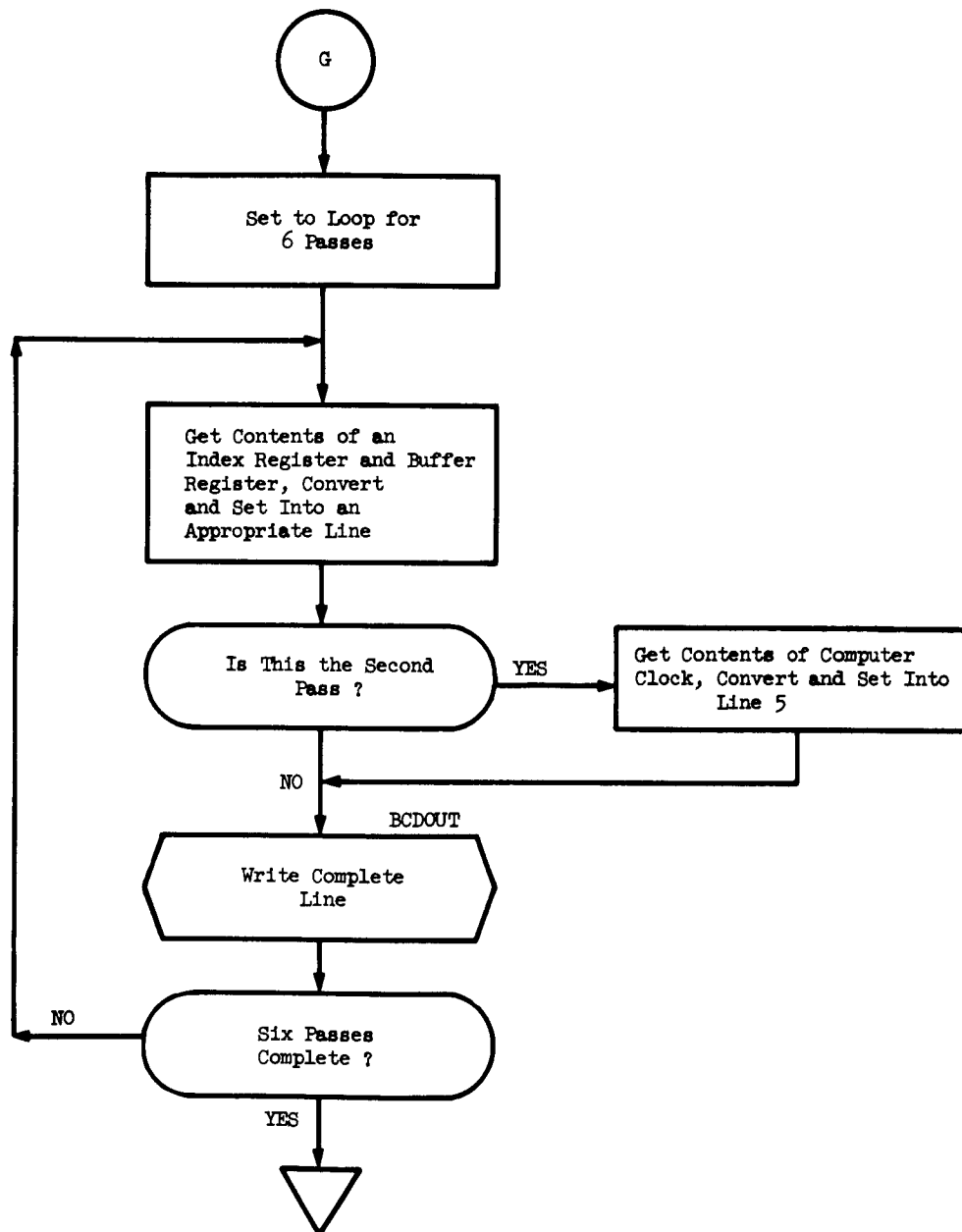


CONSOL

Reduces a Console Binary Record to BCD Format. Enter With A = Binary Record Identification Word.



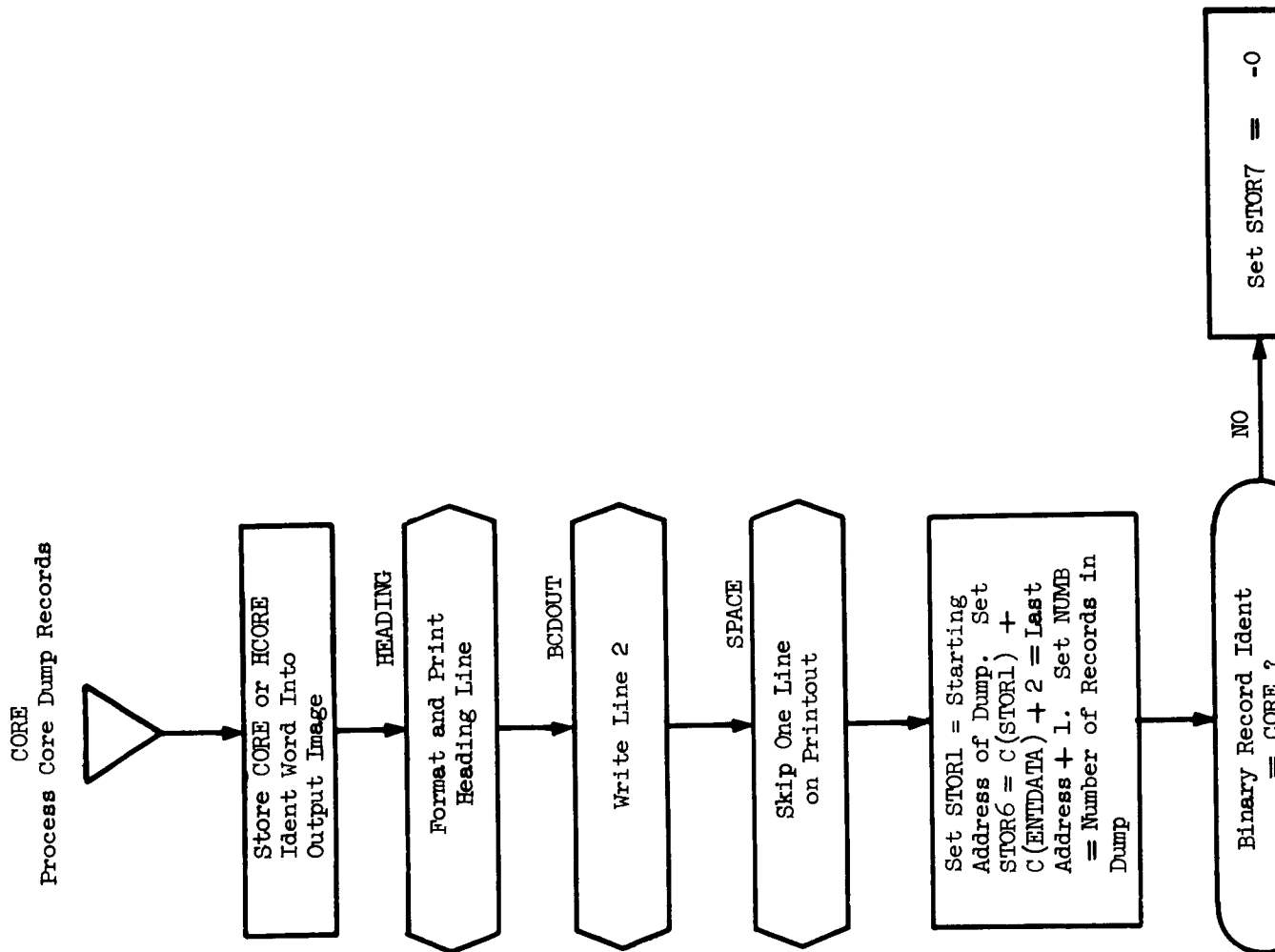
CONSOL (Continued)

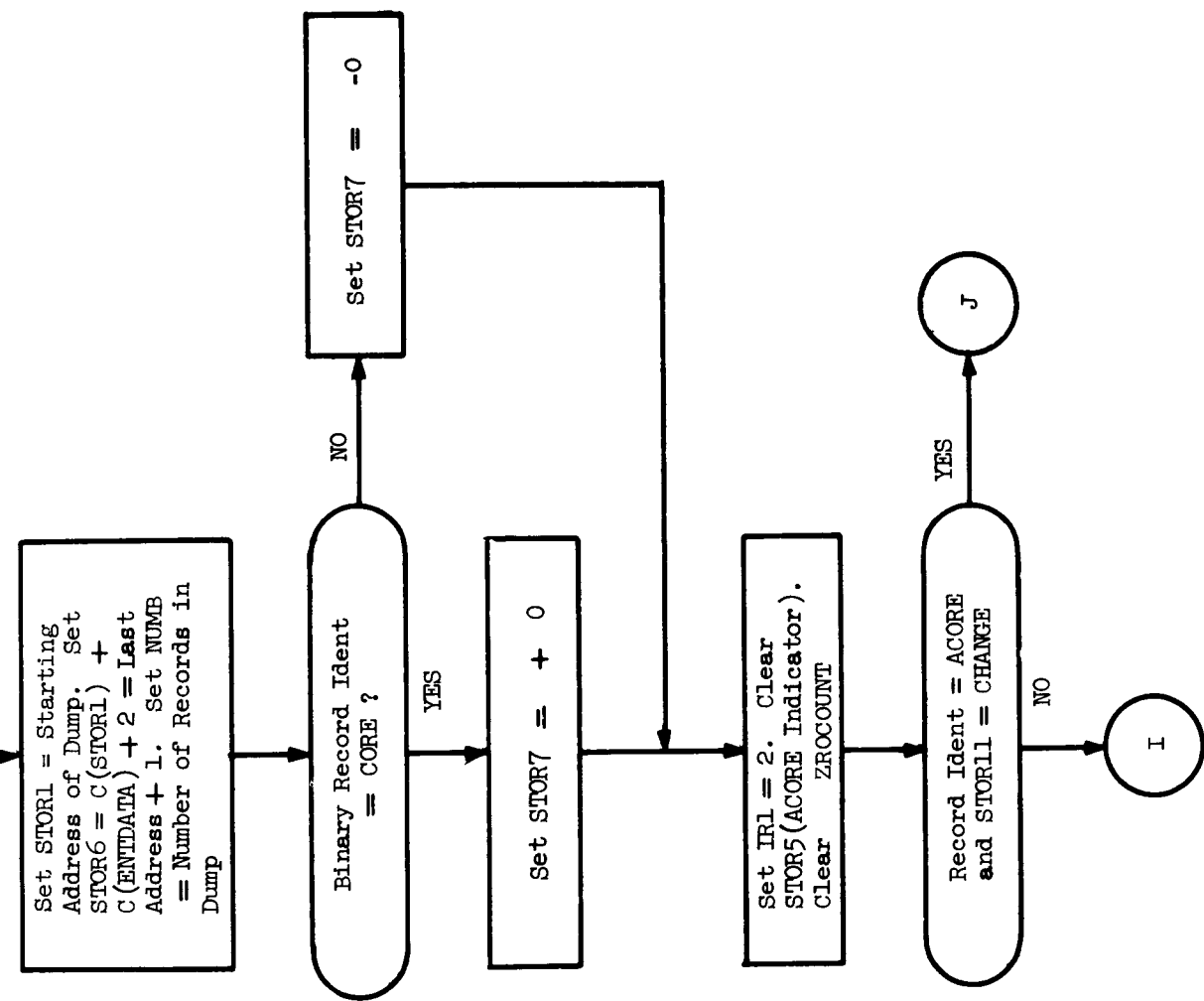


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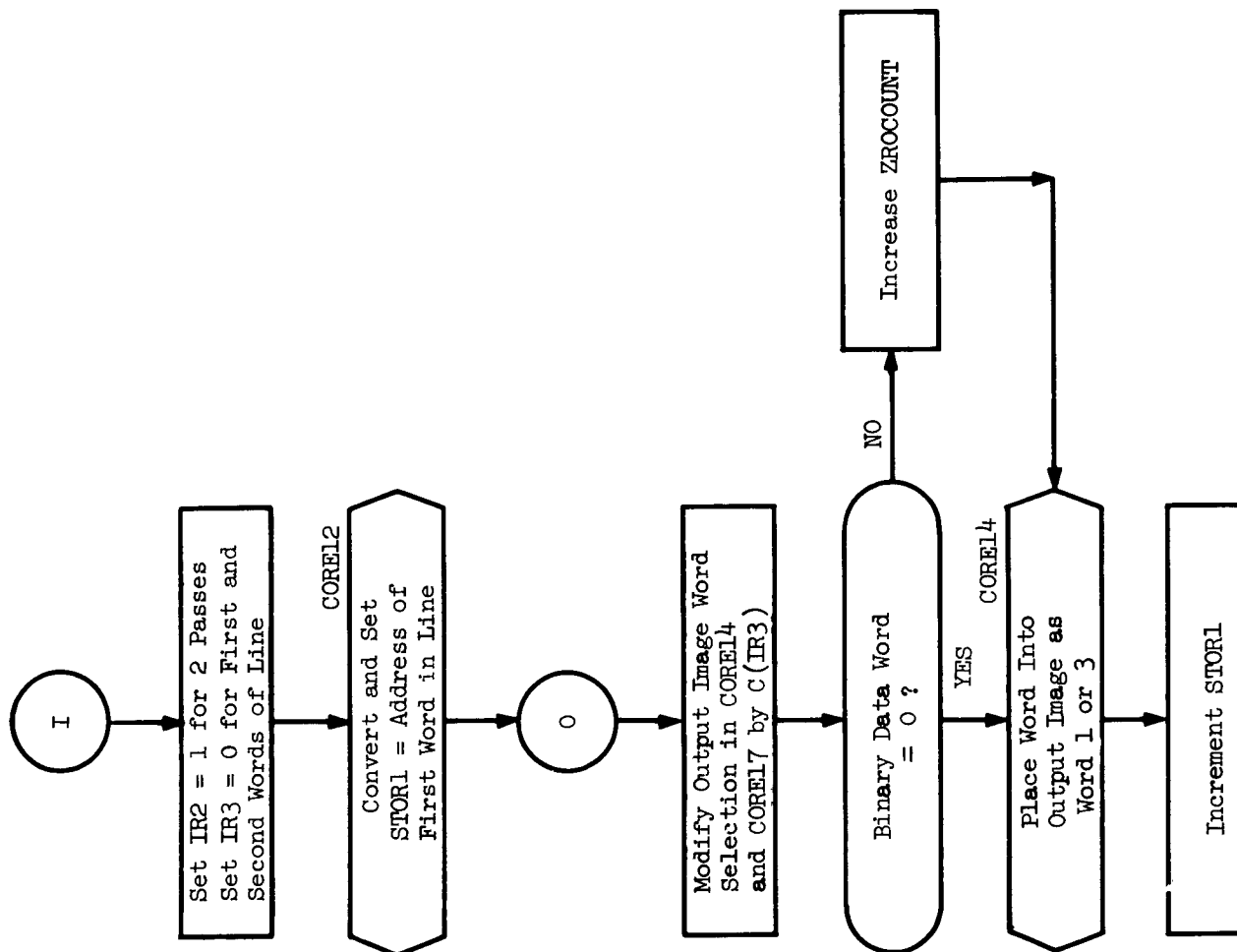
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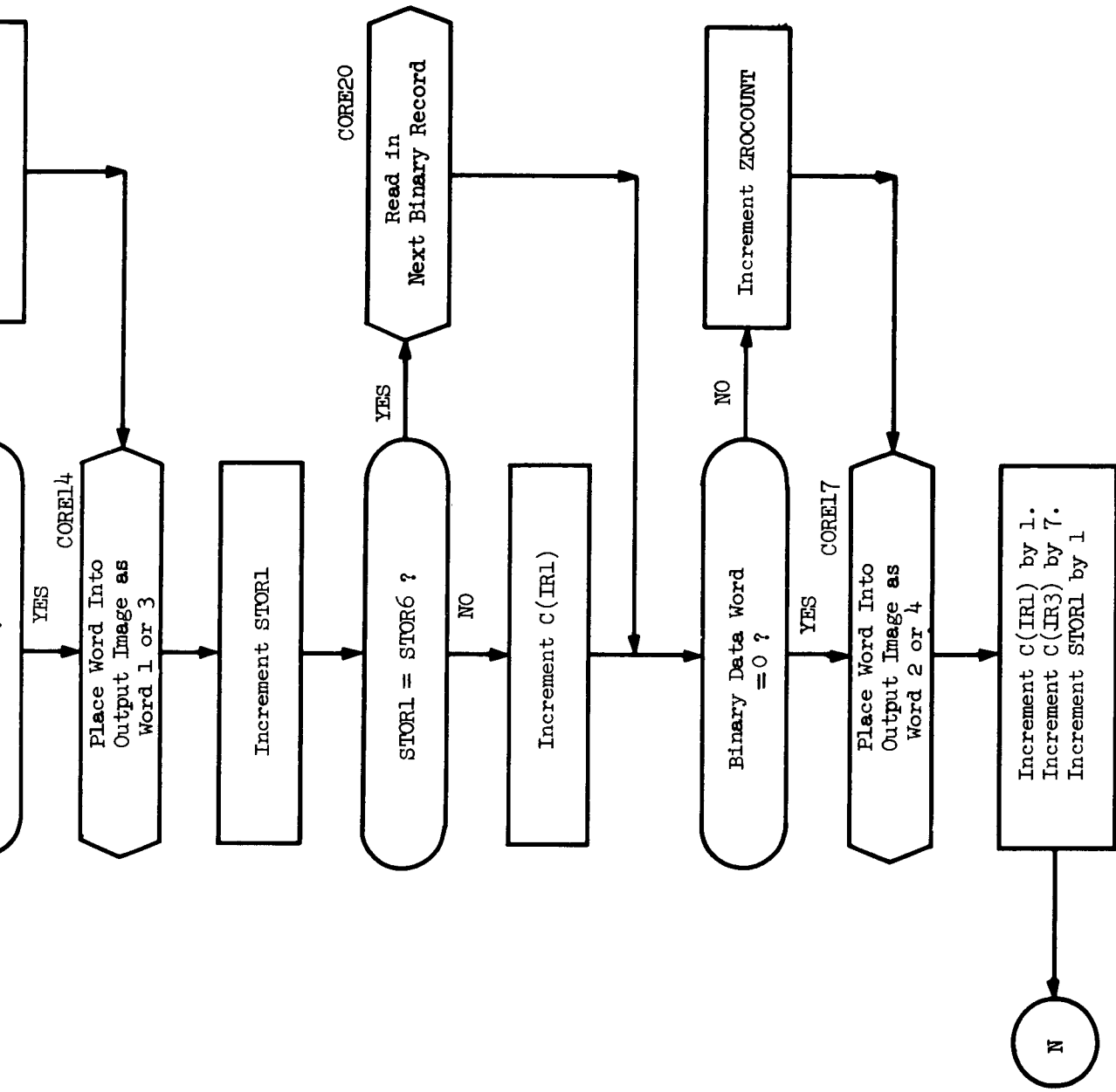
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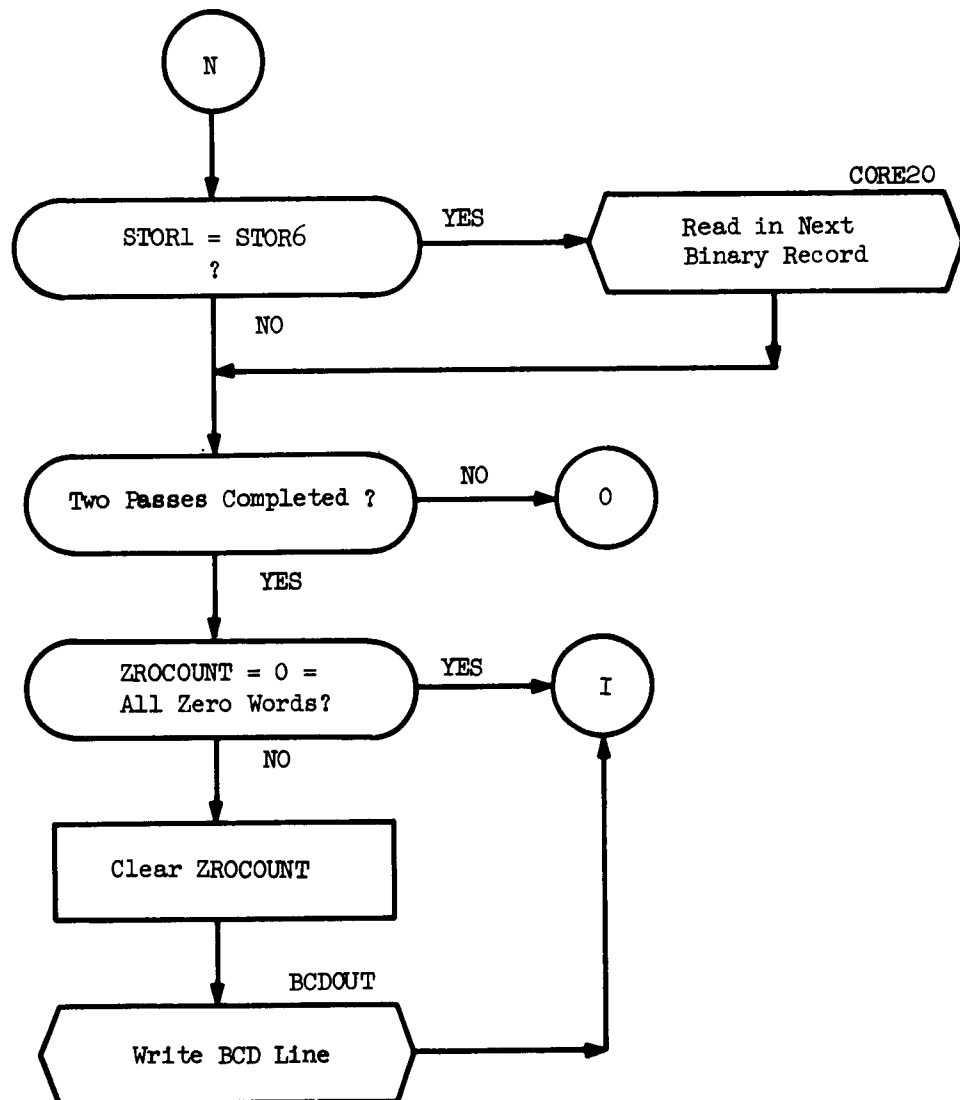


CORE (Continued)





CORE (Continued)

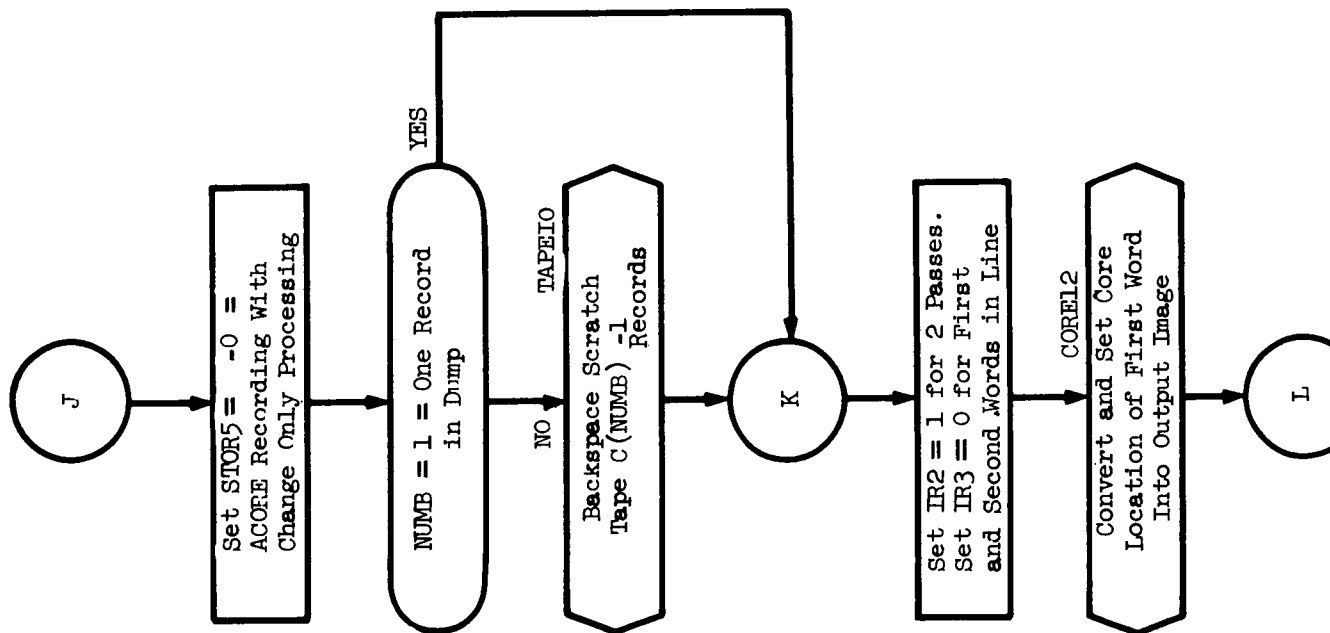


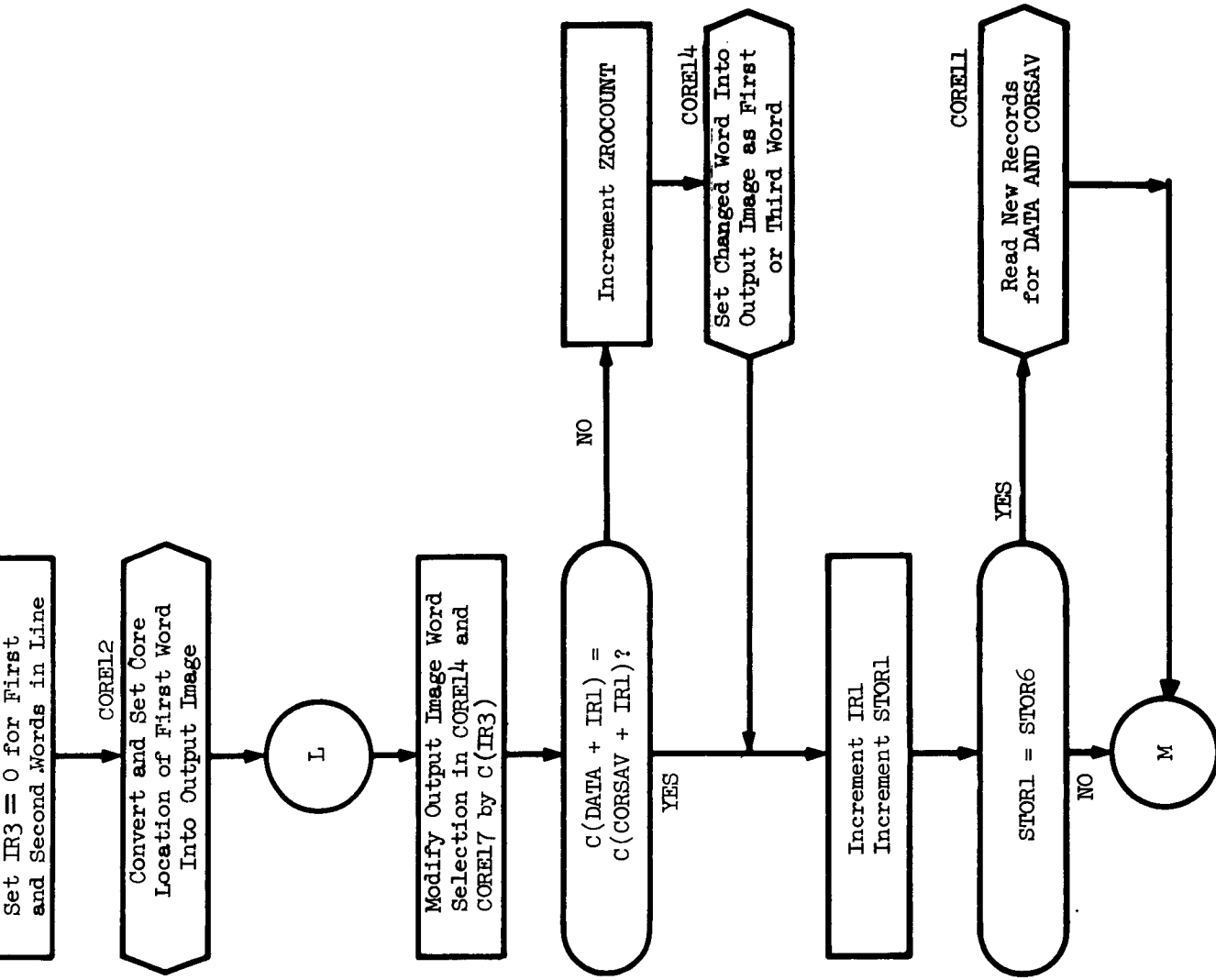
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CORE (Continued)
ACORE Processing



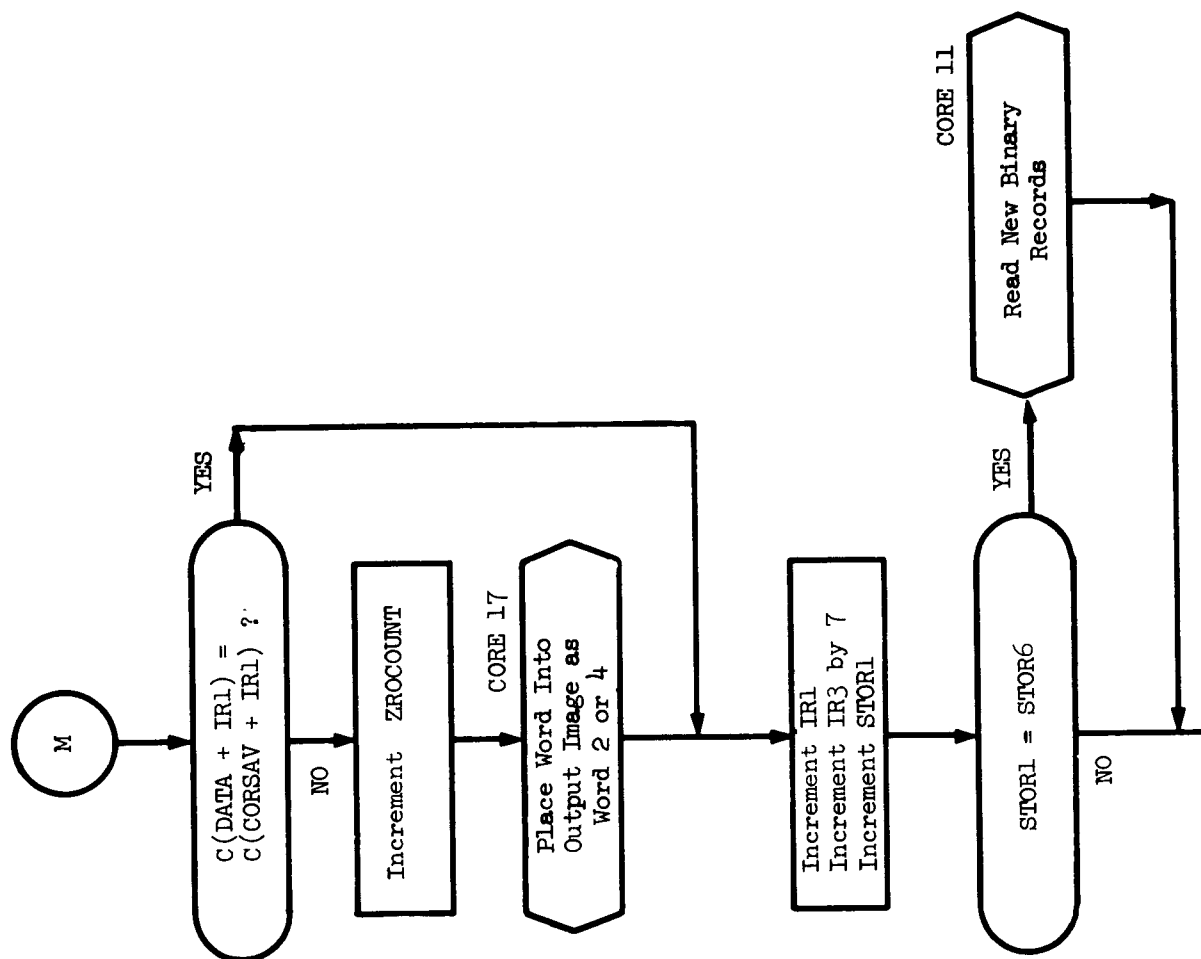


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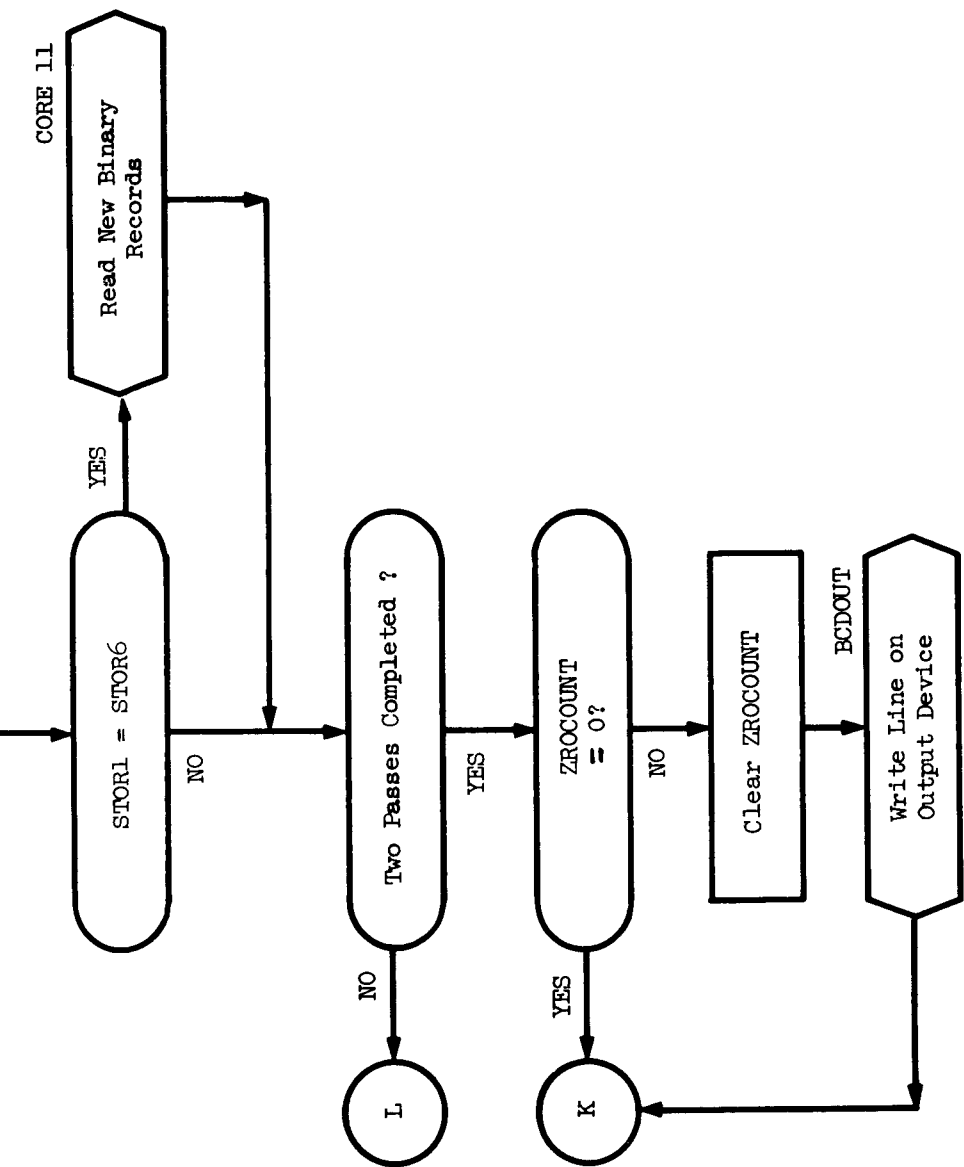
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ACORE Processing (Continued)



CORE 11

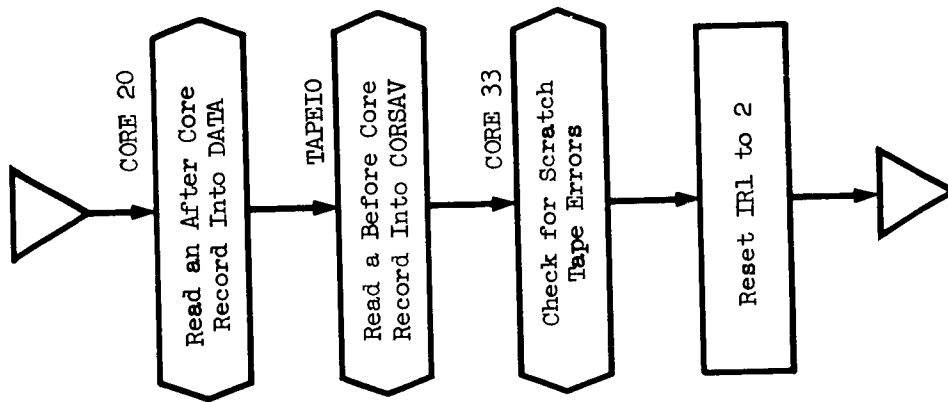


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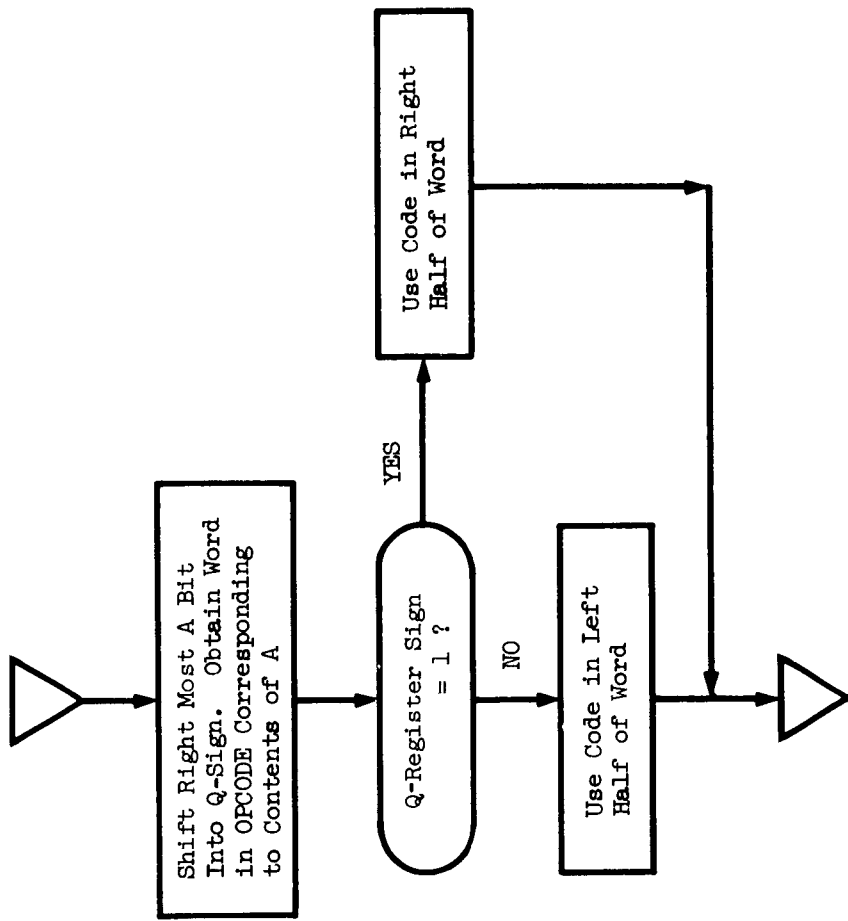
CORE 11
Read Binary Before and After
Core Dump Records



CORE31
Convert Octal Op Code (in A) to
BCD Mnemonic Code



CORE31
Convert Octal Op Code (in A) to
BCD Mnemonic Code

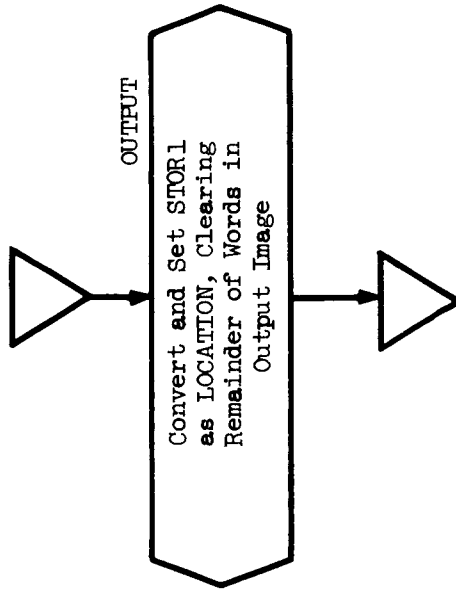


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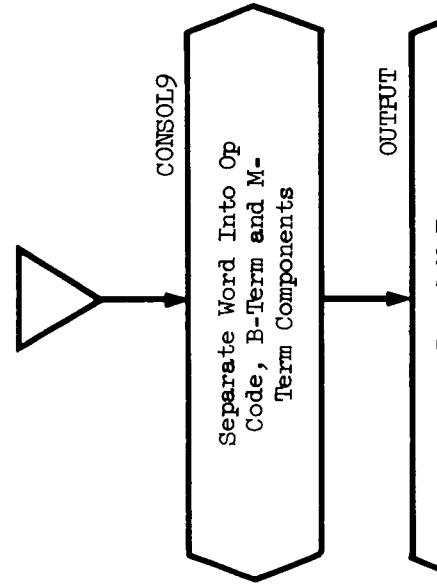
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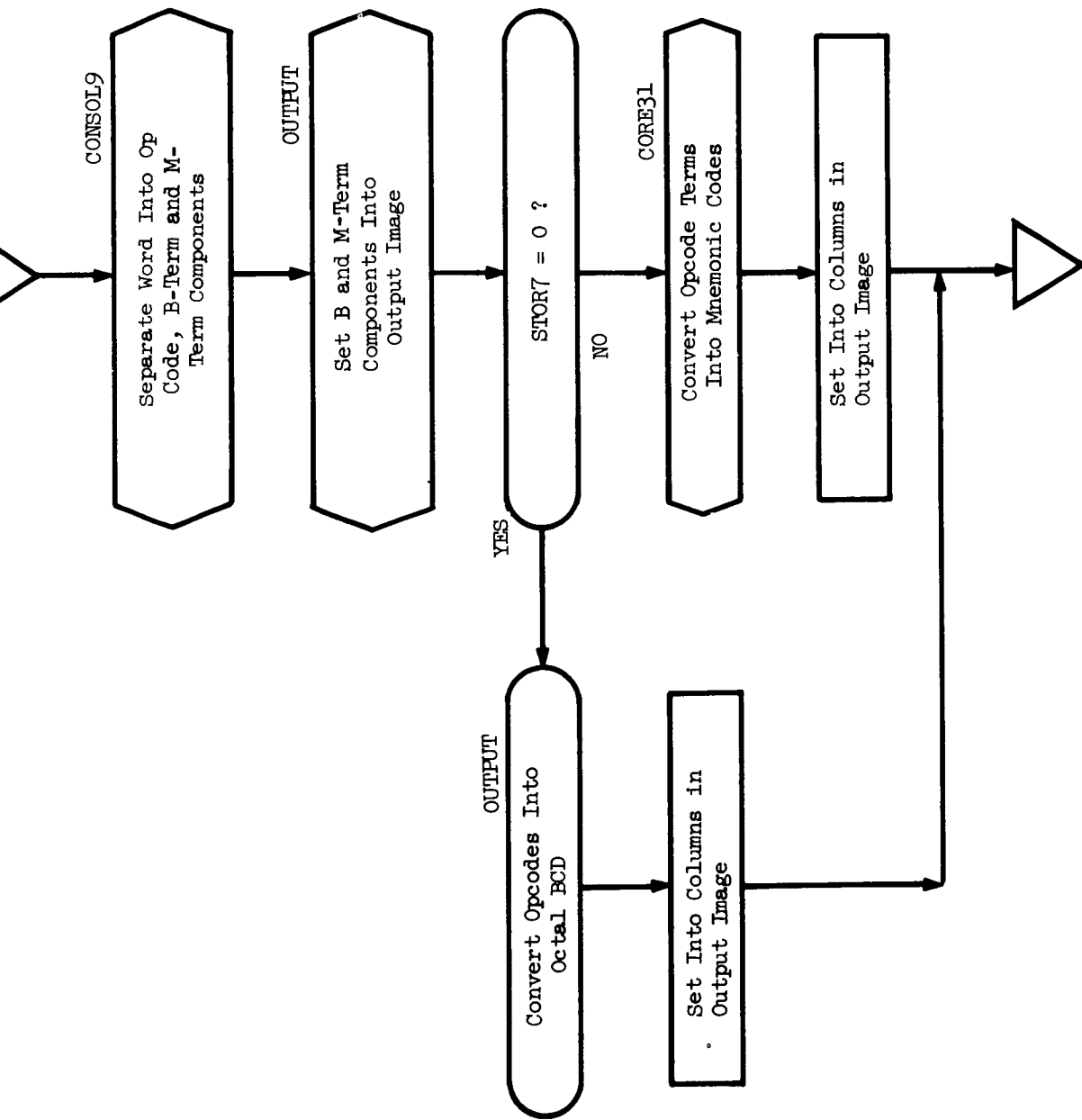
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CORE12
Sets Address of First Word of a
Line Into Output Image



CORE14 and CORE17
Set Data Word Into Output Image
Enter With Word in A



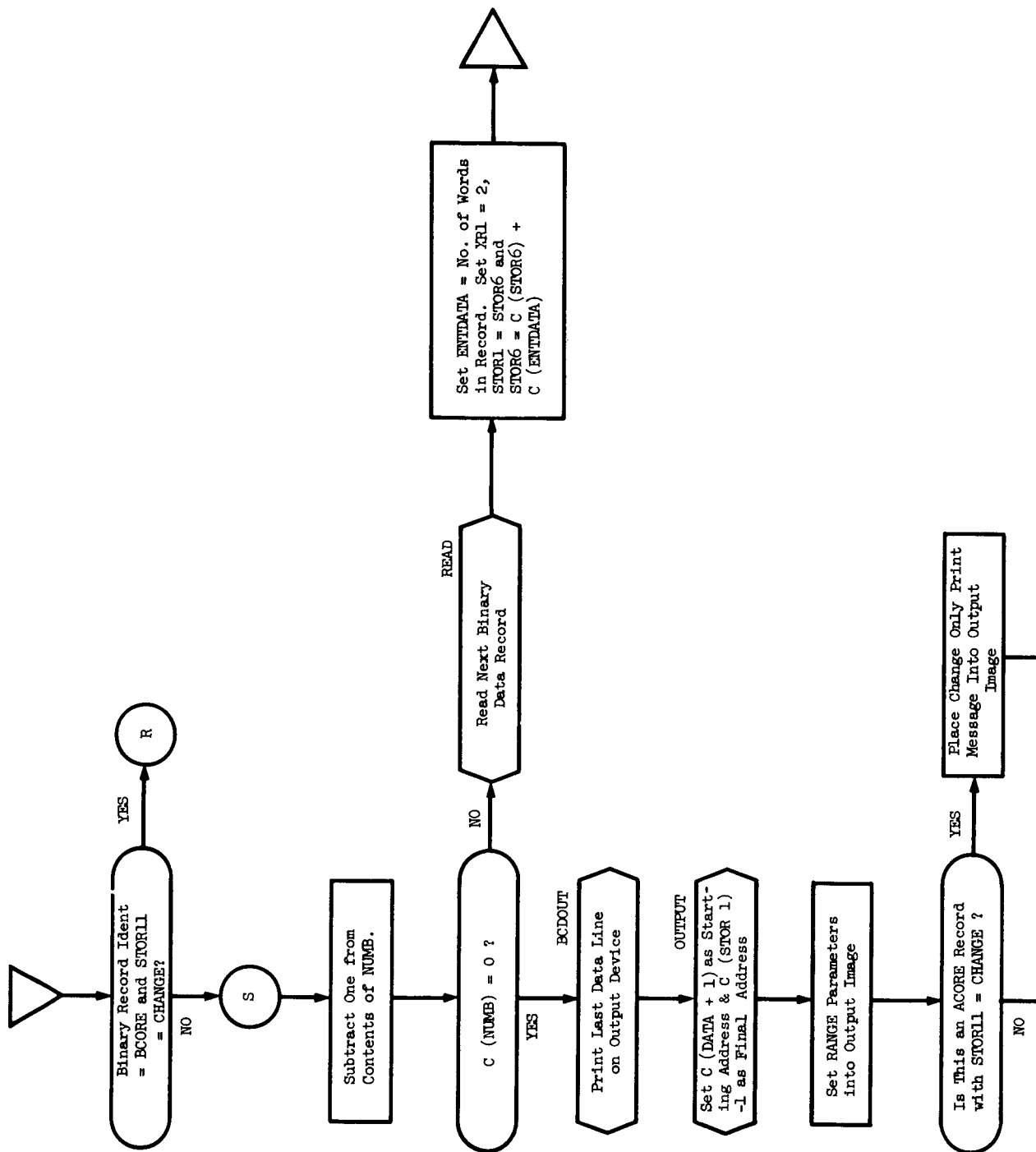


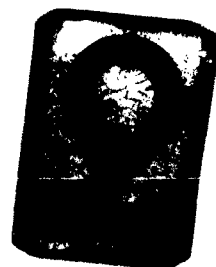
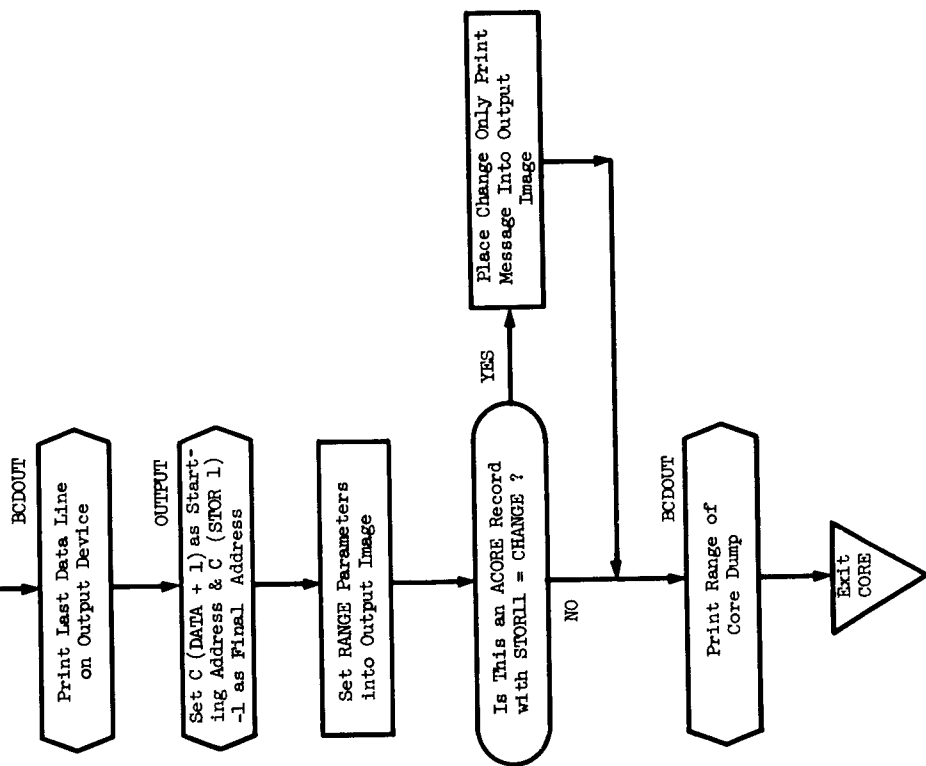
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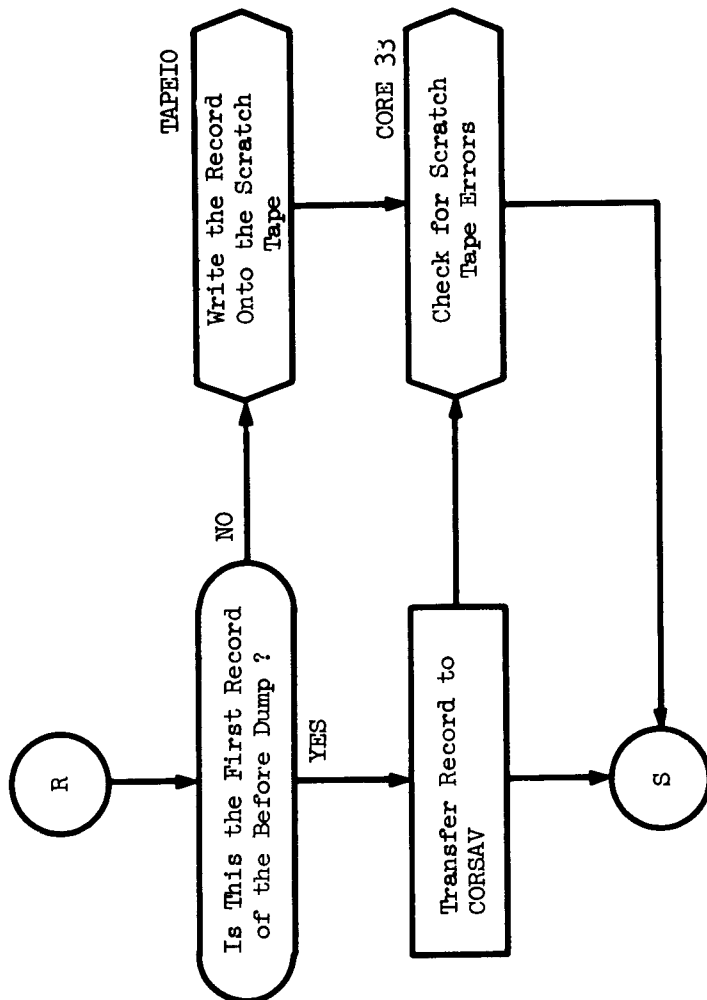
CORE 20
Read Successive Records from
STOP Recording Tape





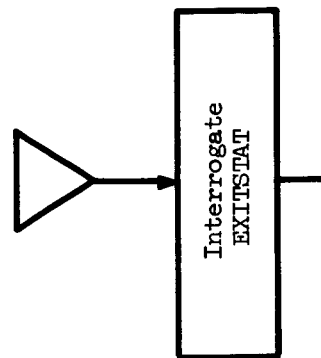
CORE 20 (continued)

Before Core Records Maintenance



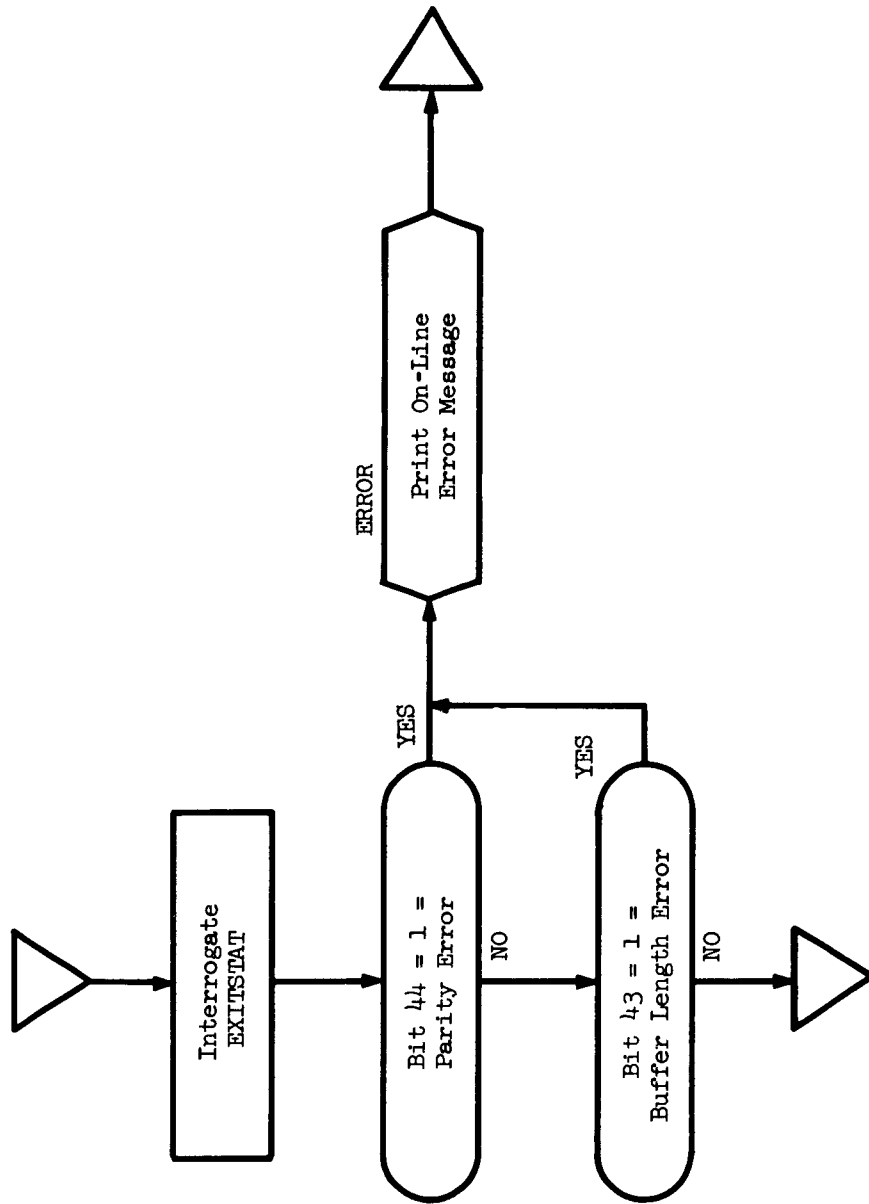
CORE 33

Binary Scratch Tape Error Check



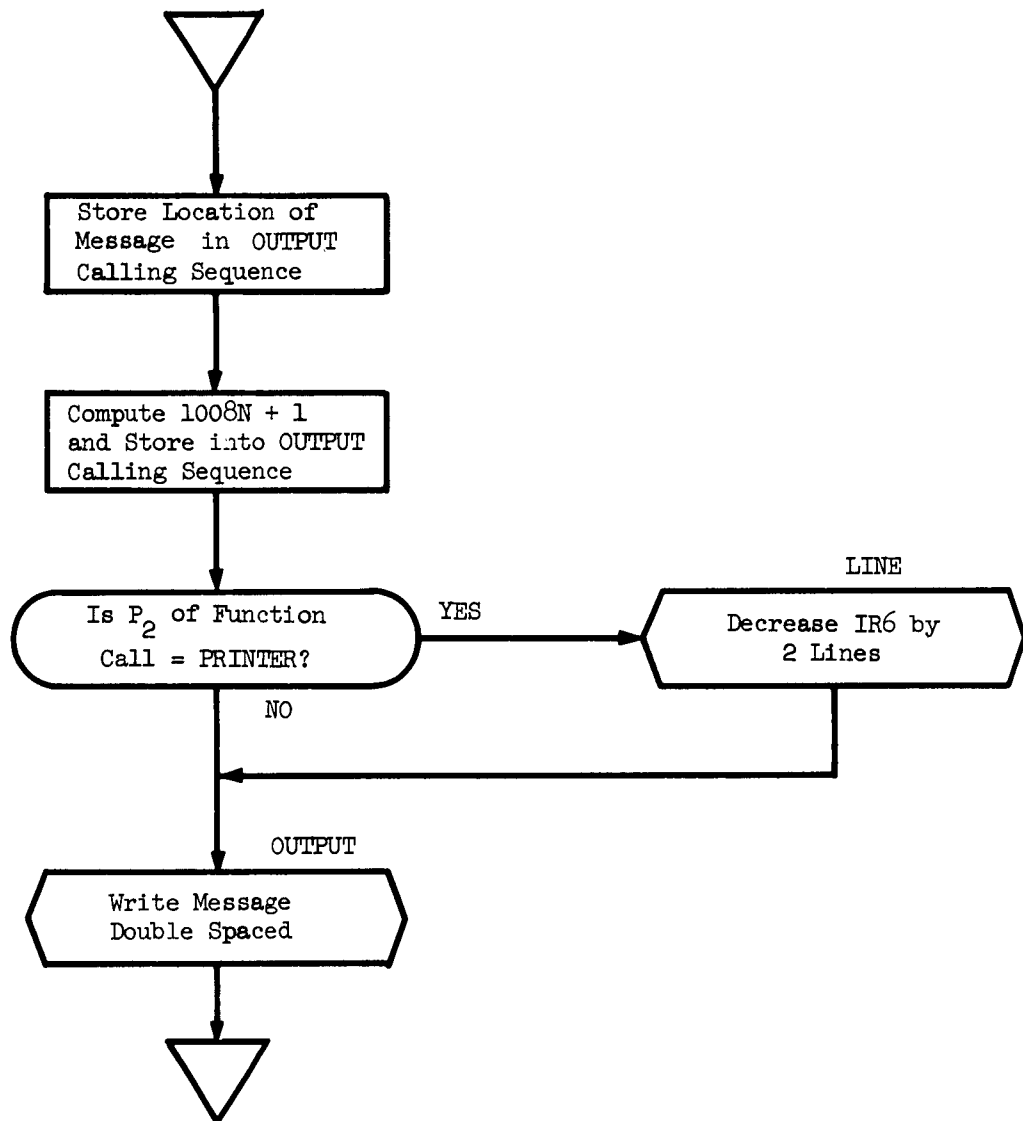
CORE 33

Binary Scratch Tape Error Check



ERROR

Writes One Line on the Printer
Enter with A = Location of Message
and Q = Number of Words in Message, N.

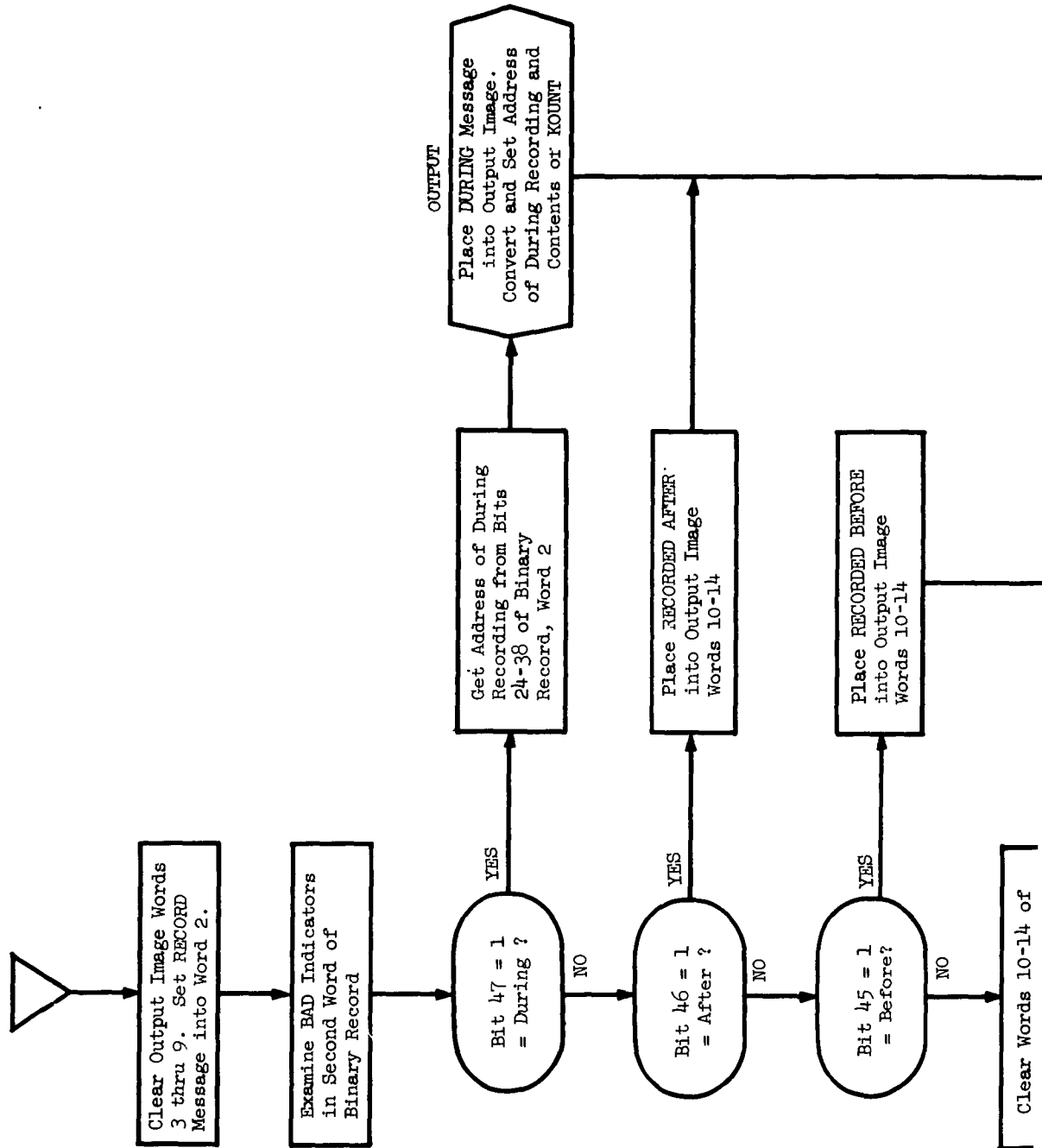


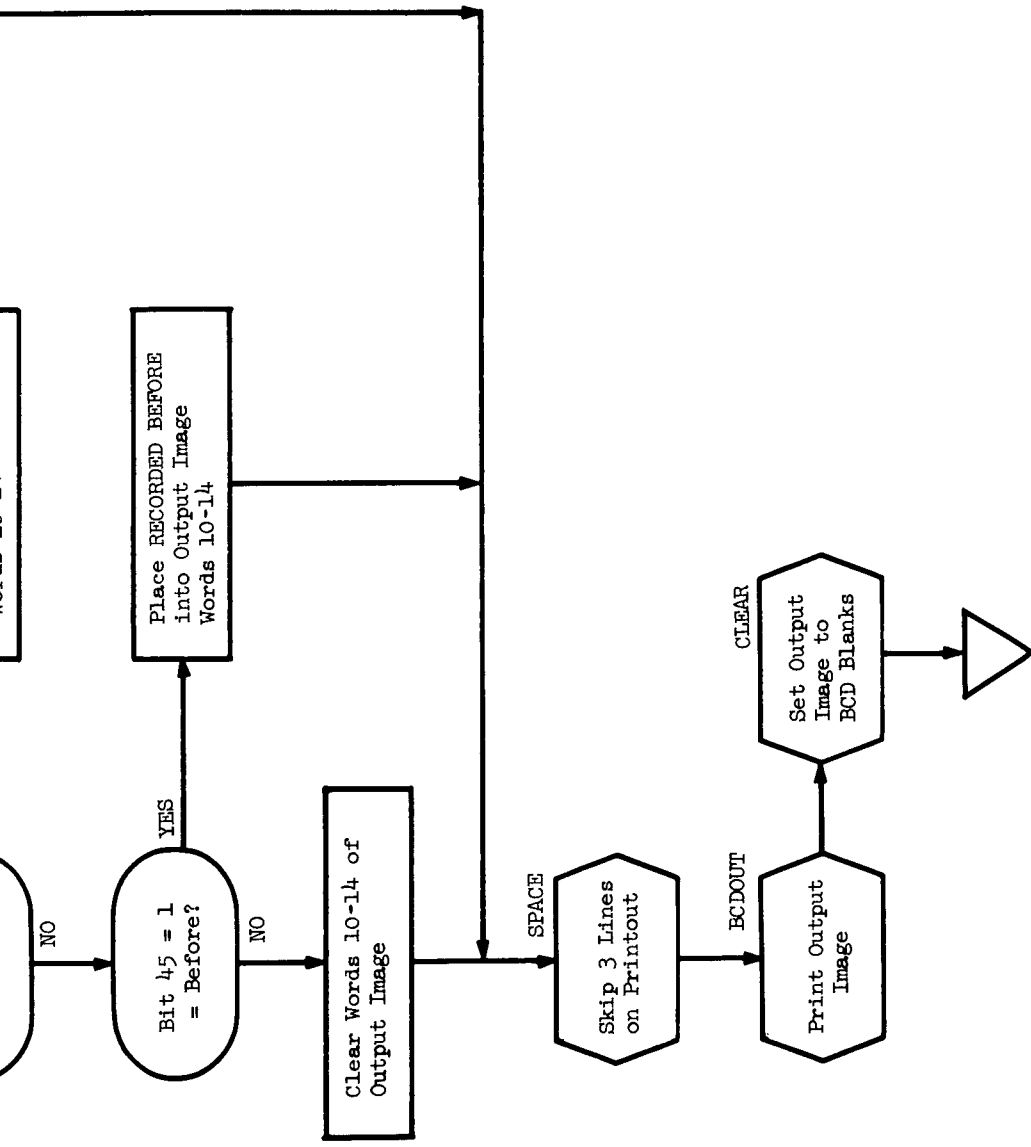
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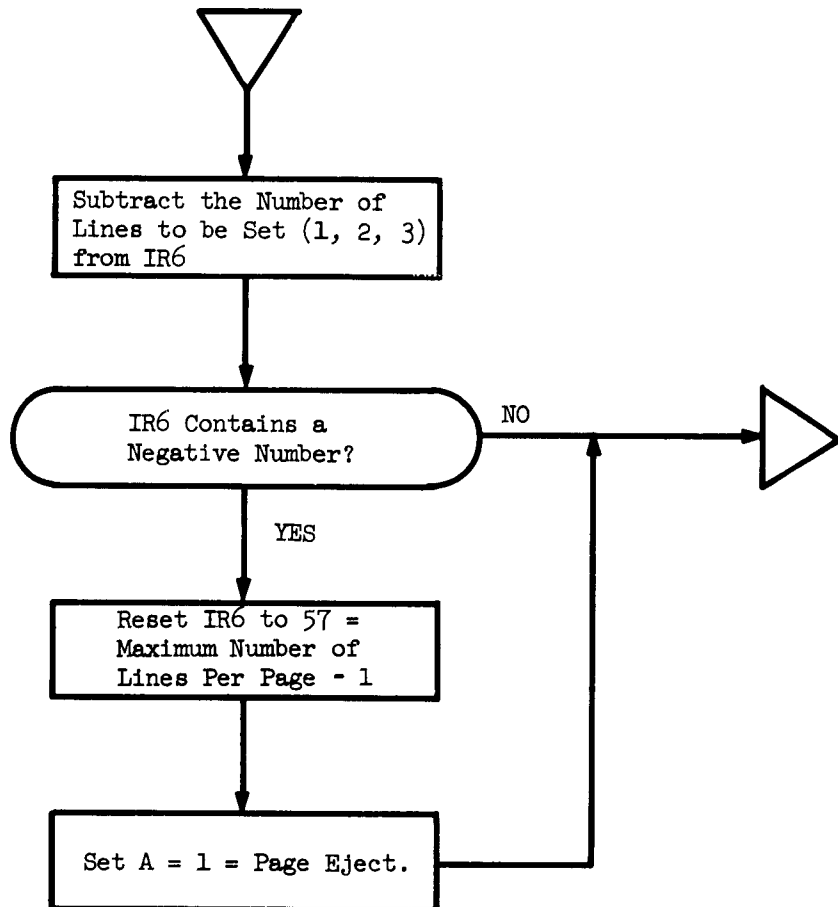
HEADING
Constructs and Prints the First Line of Each Data Block





LINE

Controls the Number of Lines Per Page on the Printer. Enter with A = the Printer Control Character.

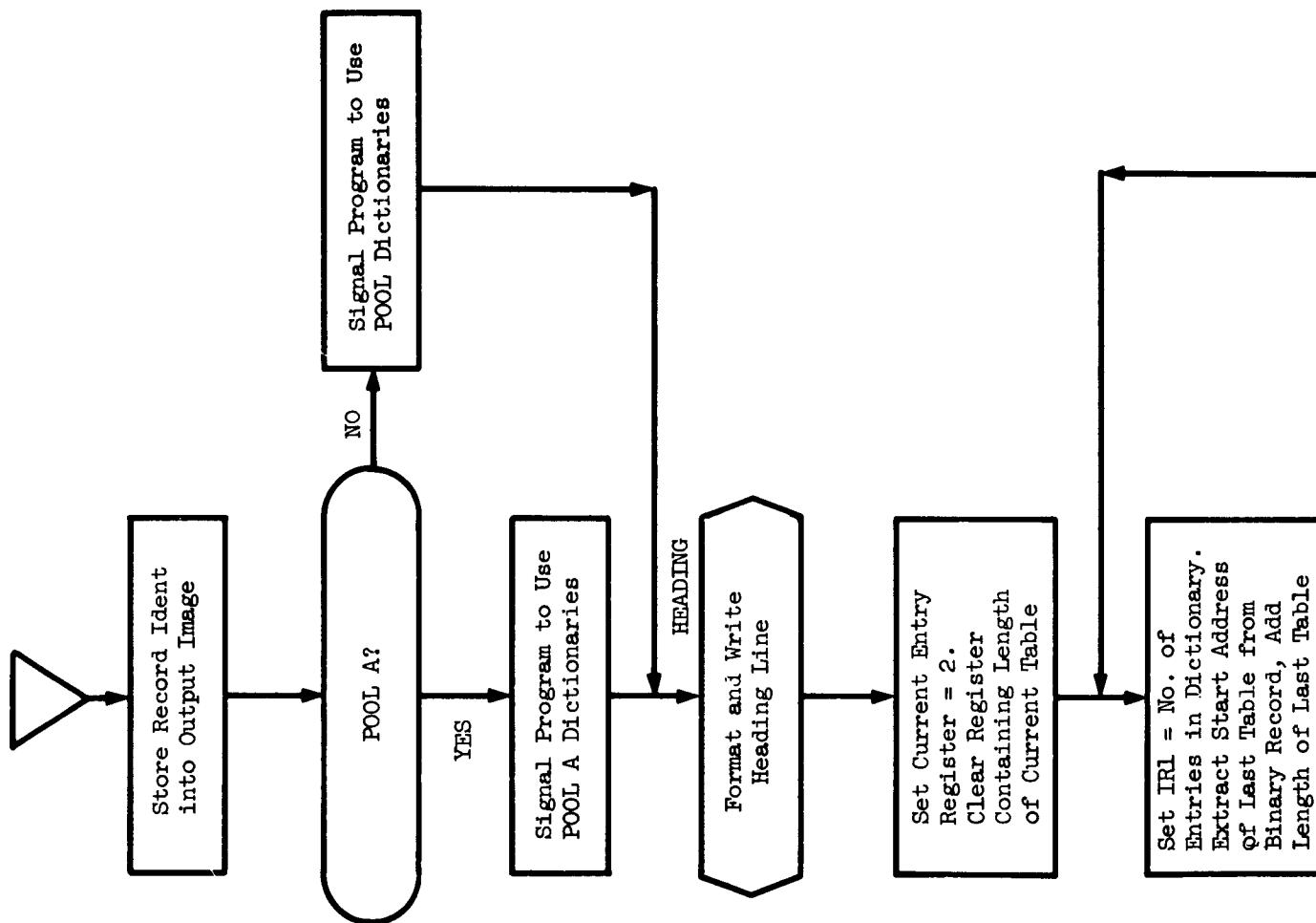


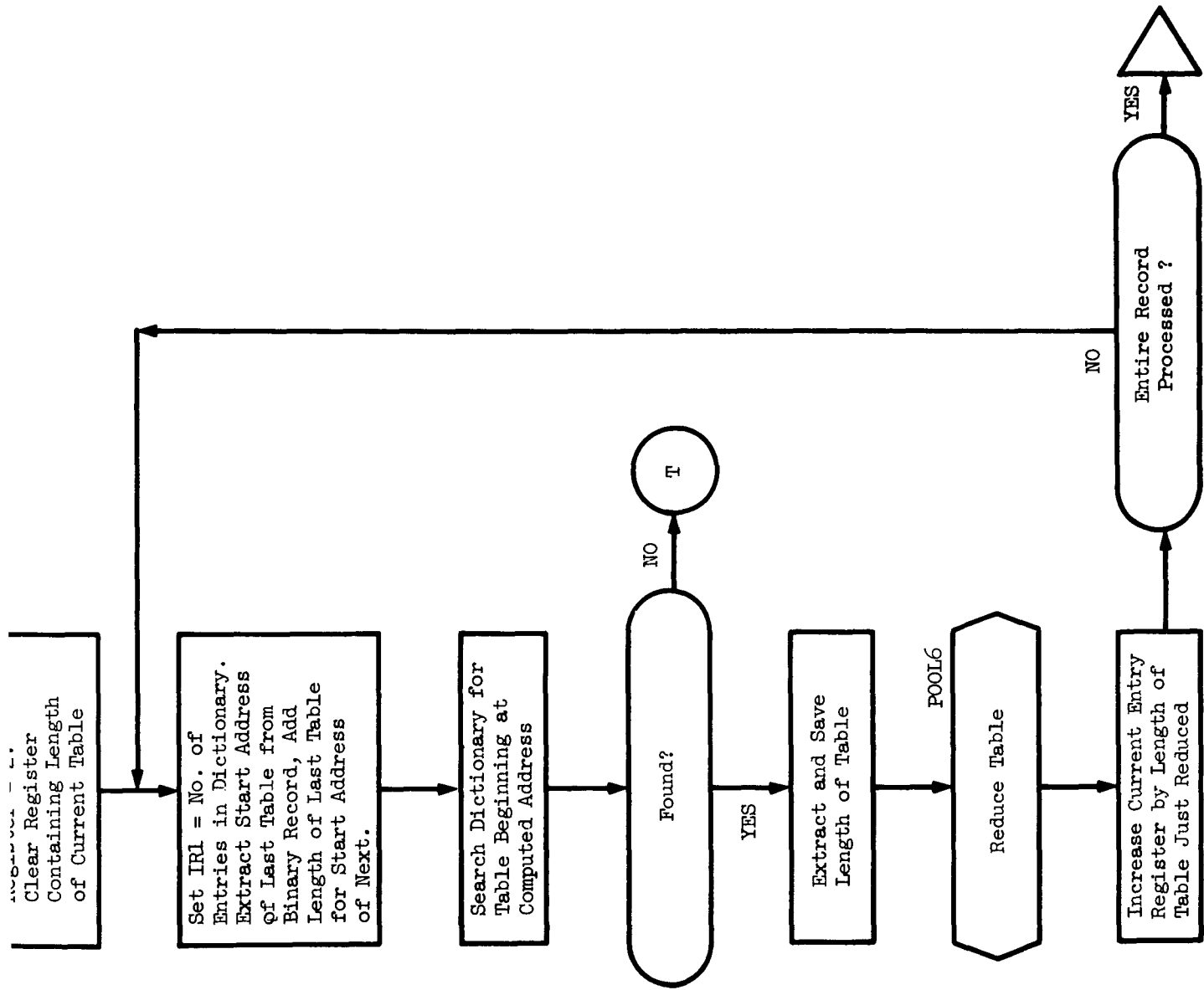
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POOL
Reference Pool Reduction





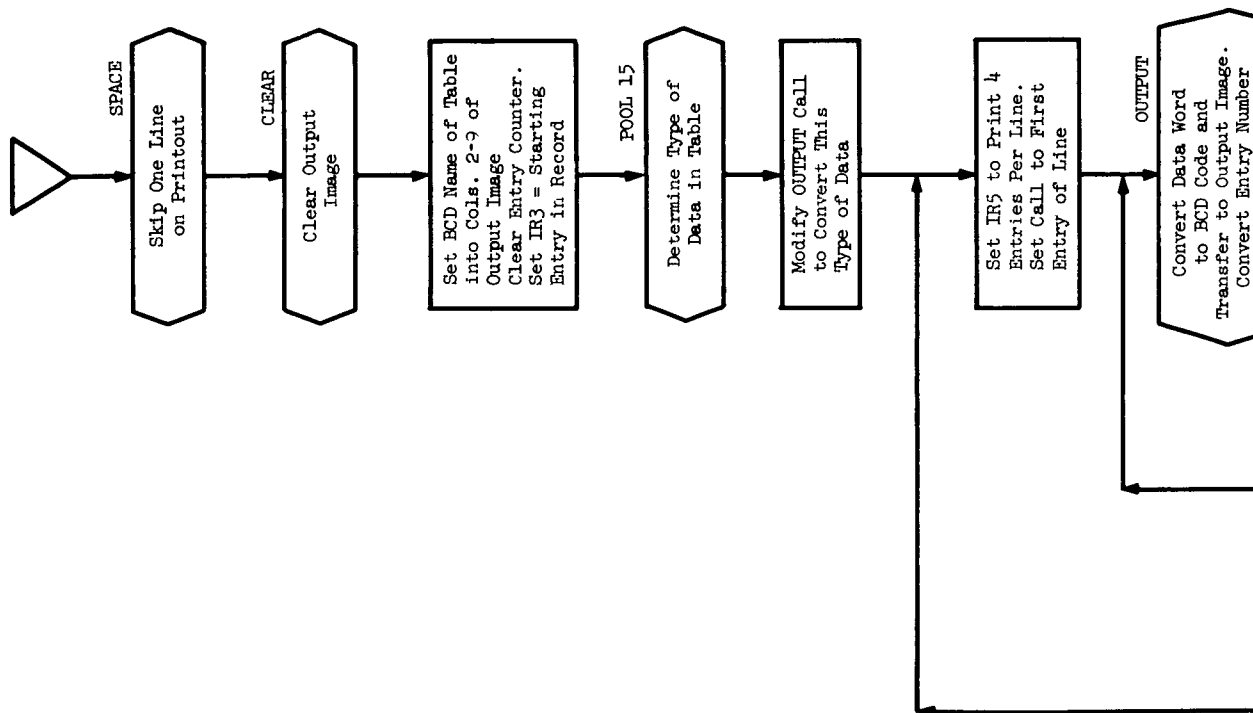
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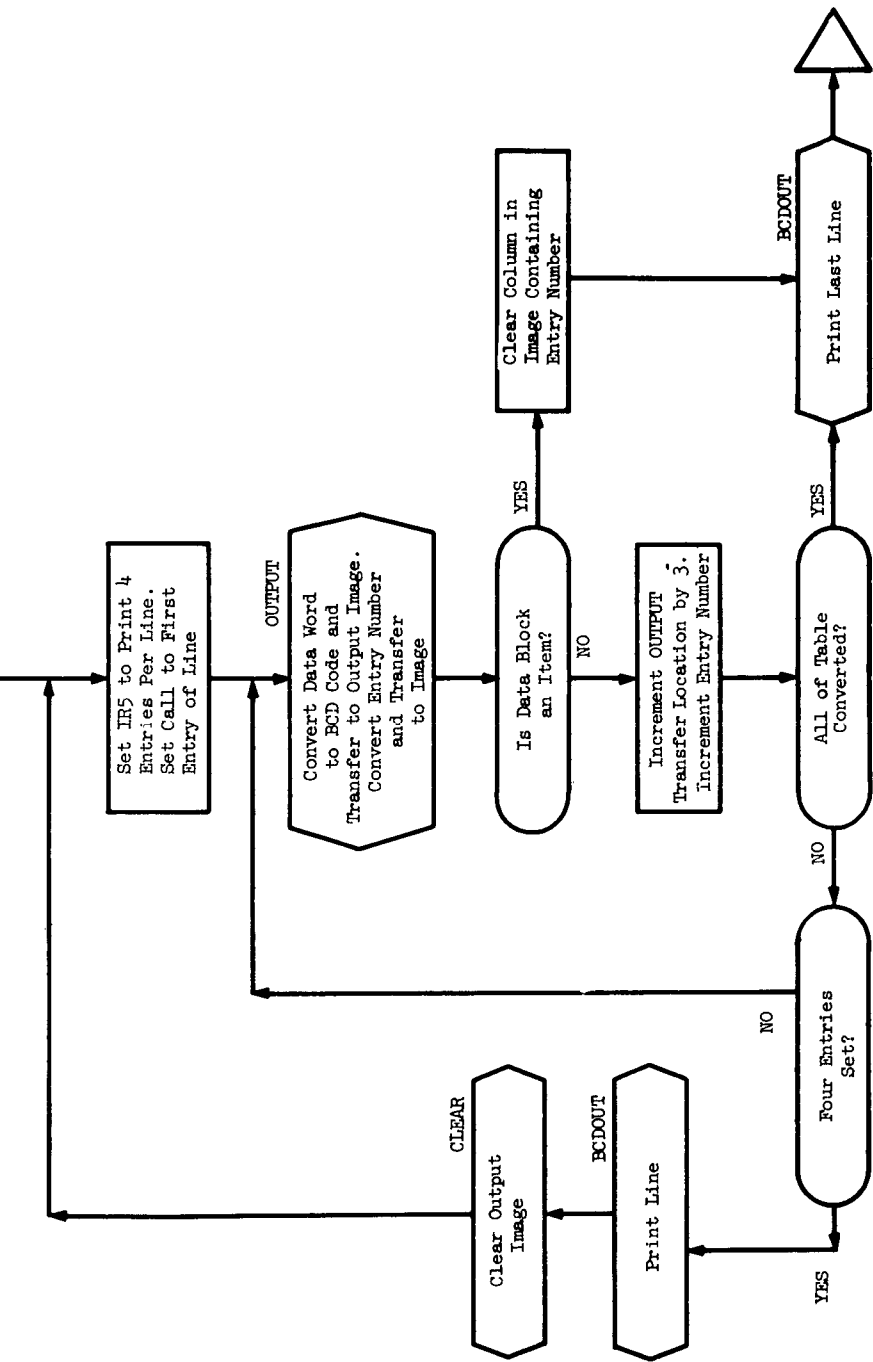
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POOL 6

Reduce and Write One Table or Item



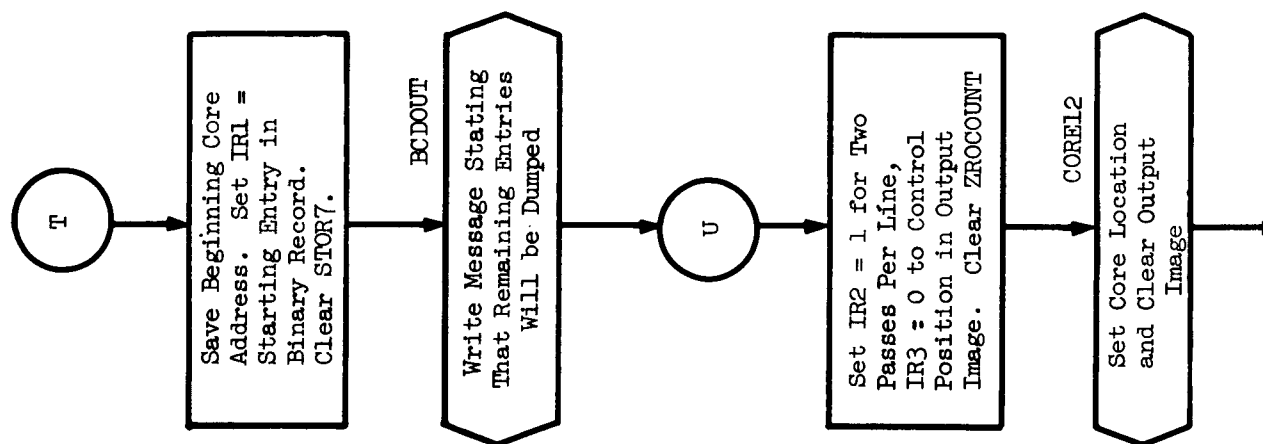


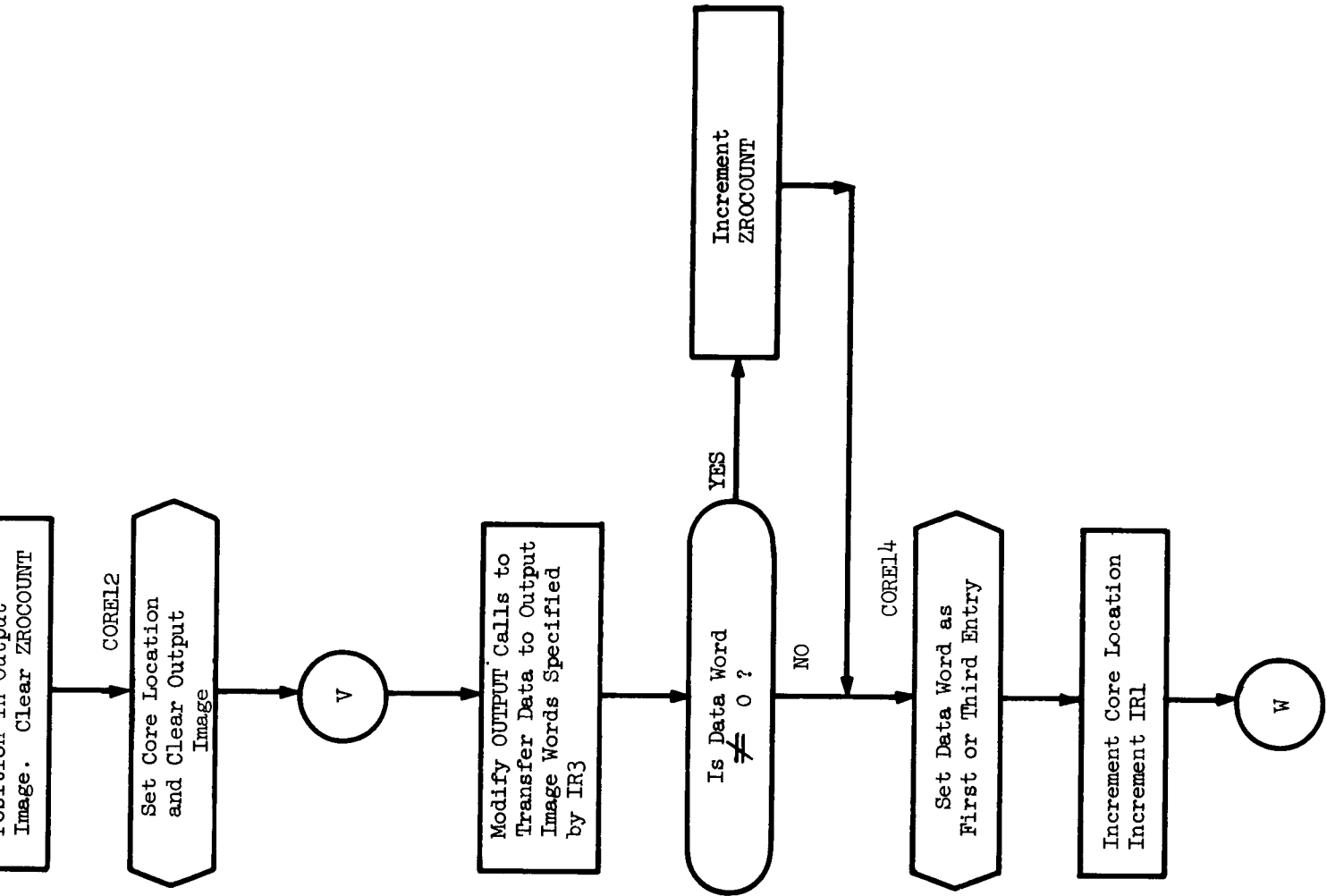
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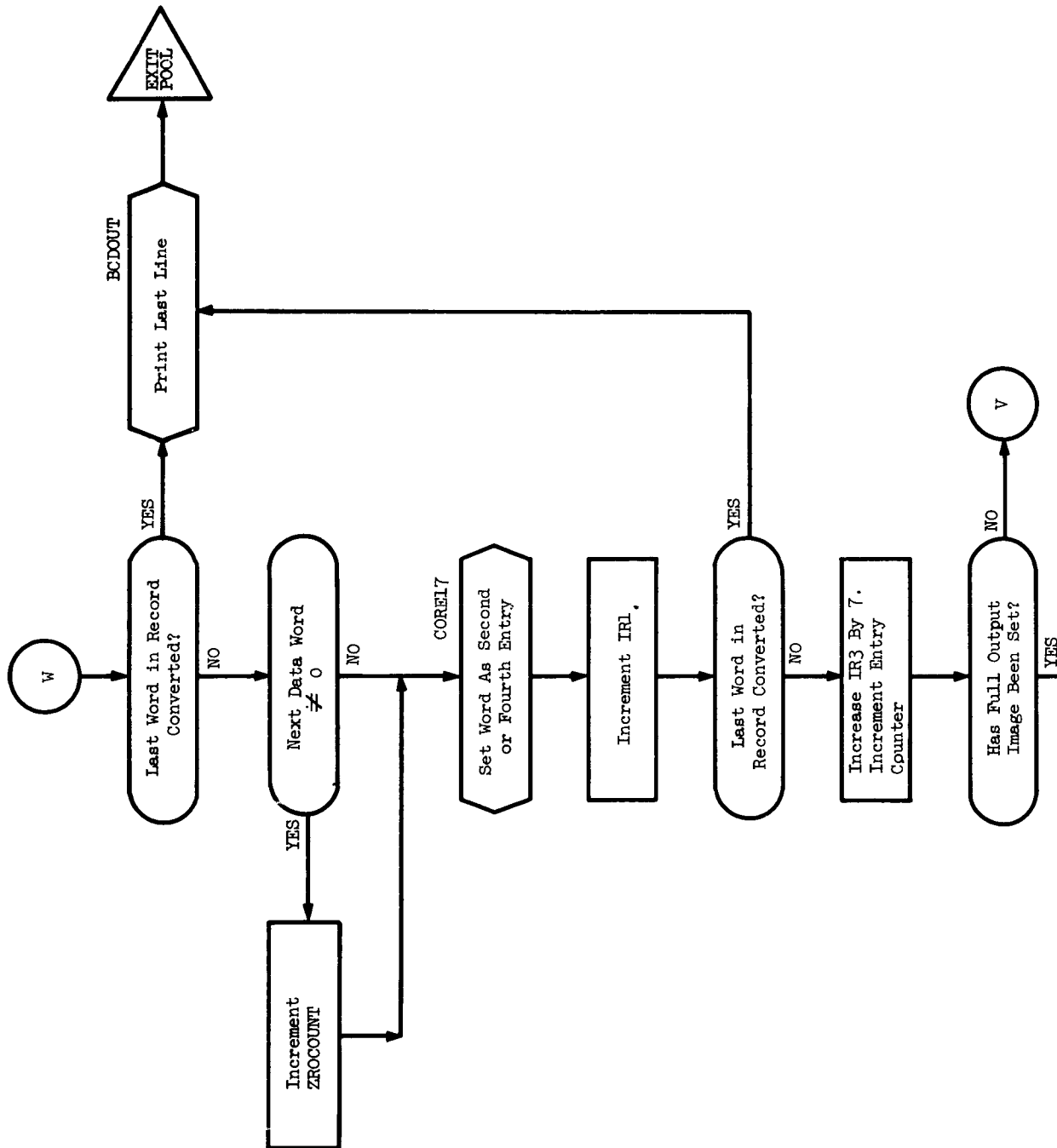
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POOL 35
Prints Octally Any Unrecognized Entries
in a Reference Pool Record.

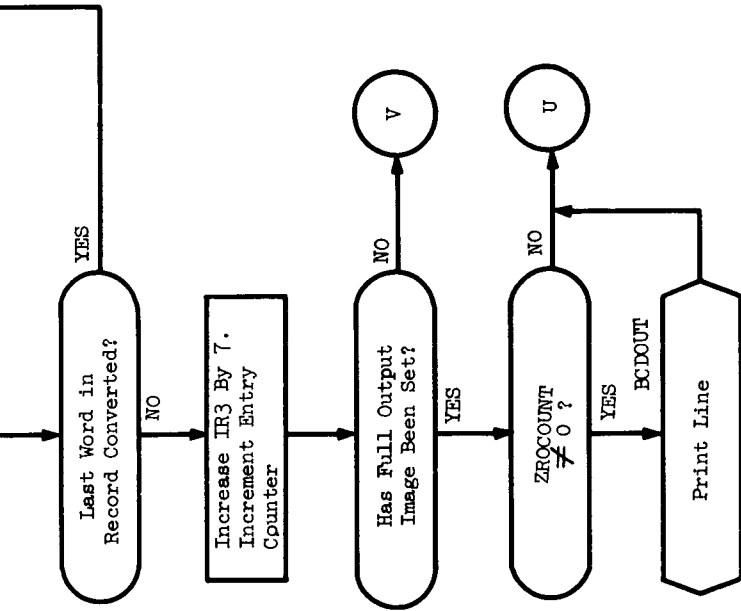




POOL 35 (continued)

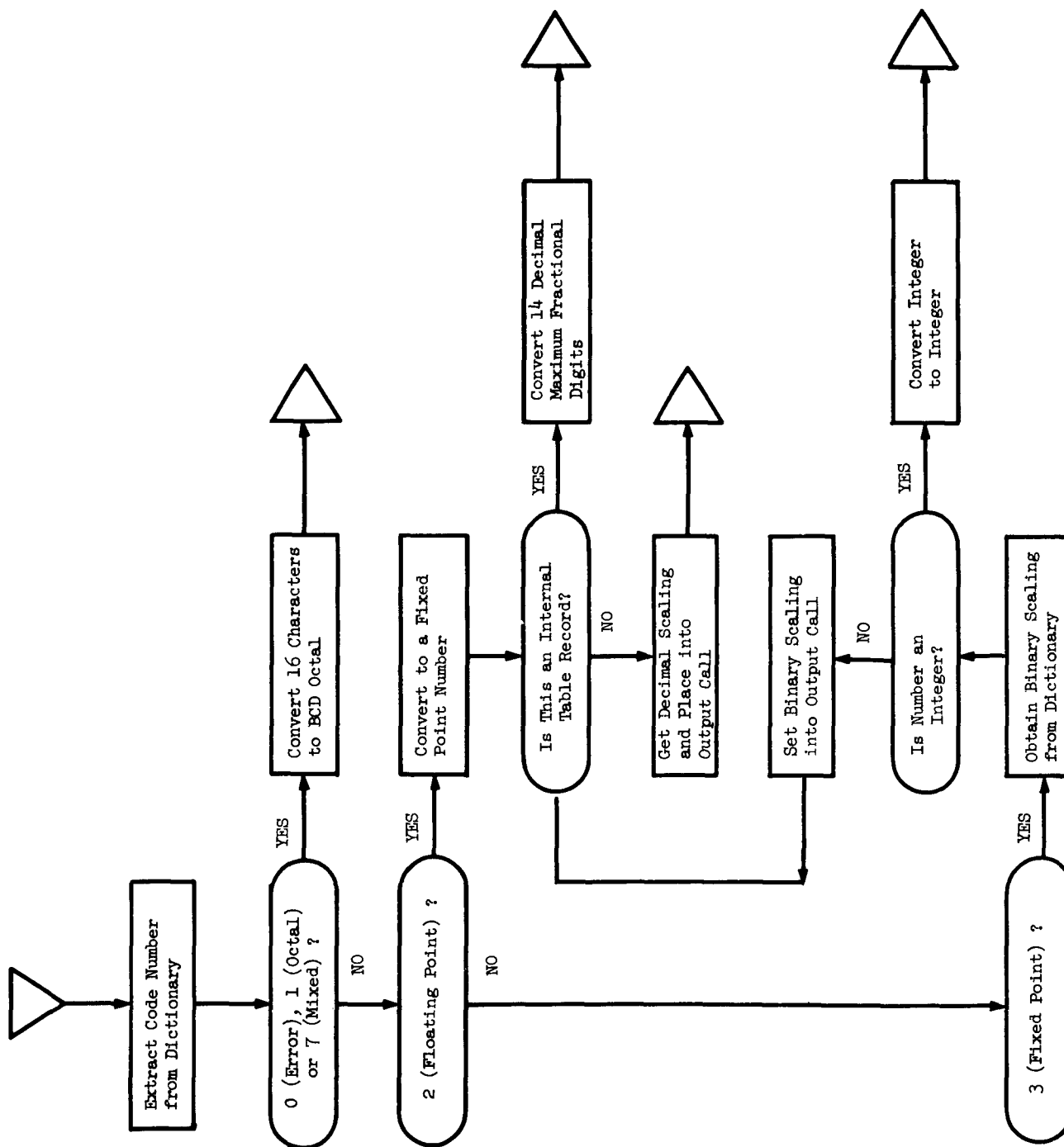


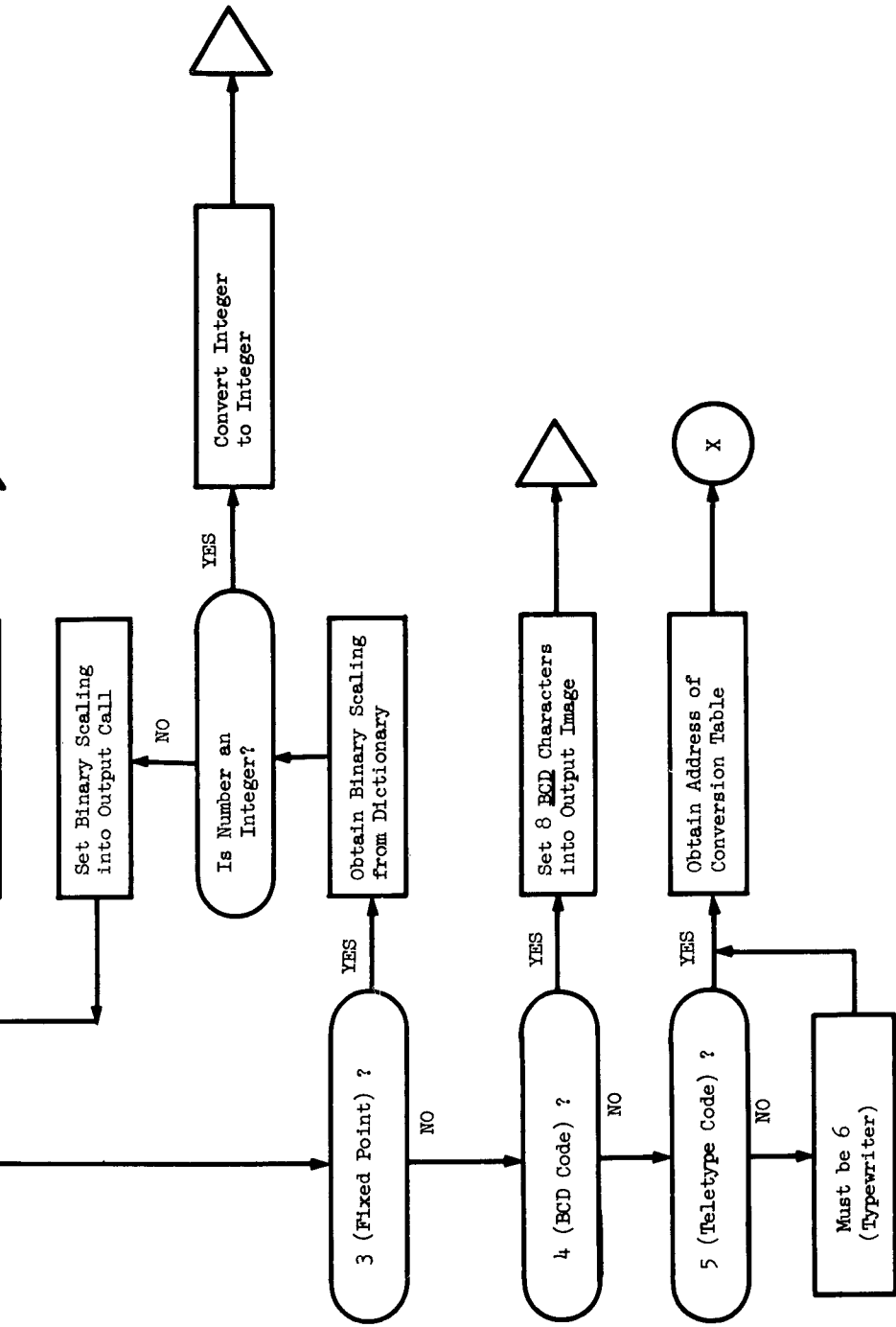
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POOL15

Data Code Determination Routine
Exit with Output Call Code in A





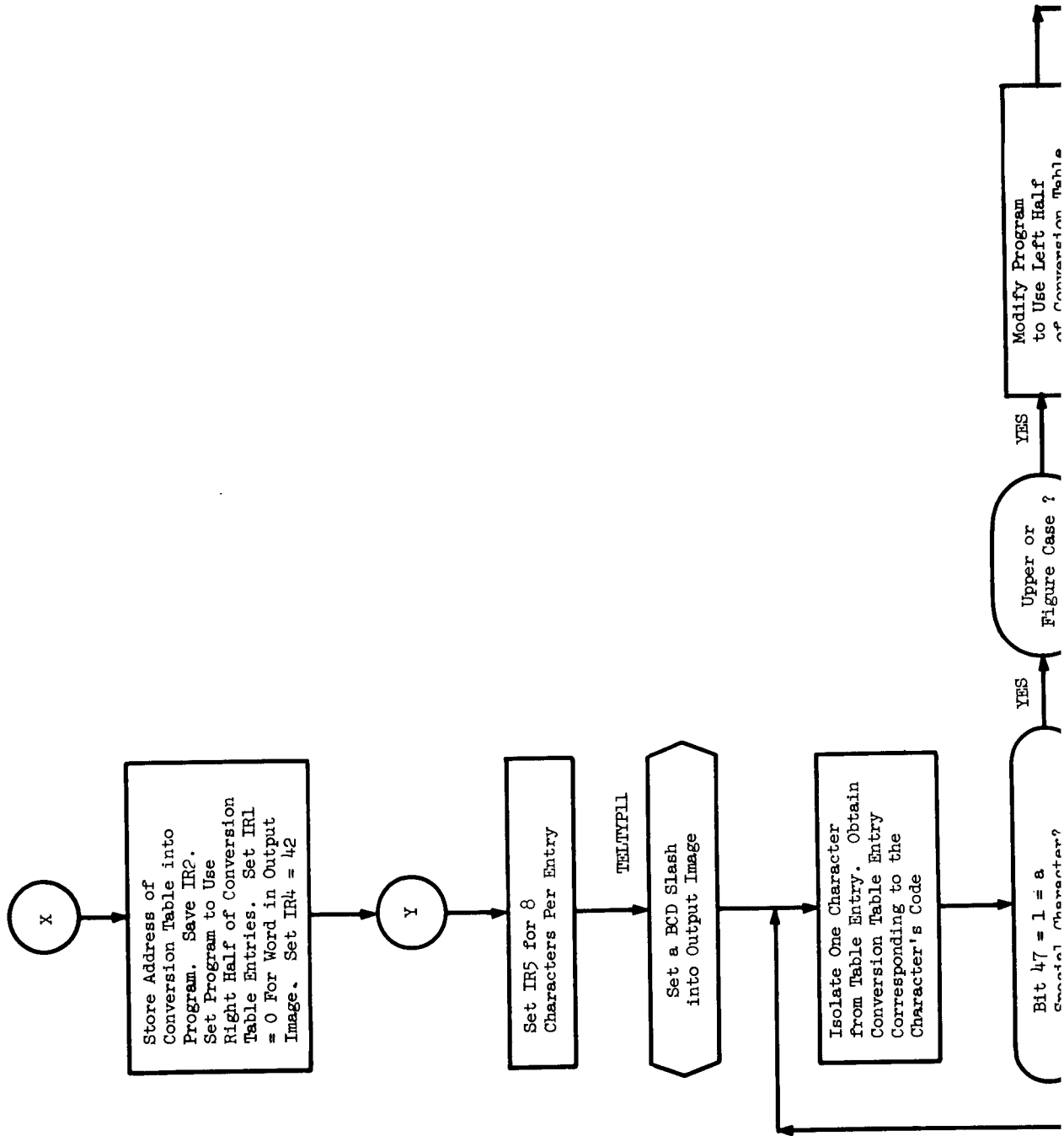
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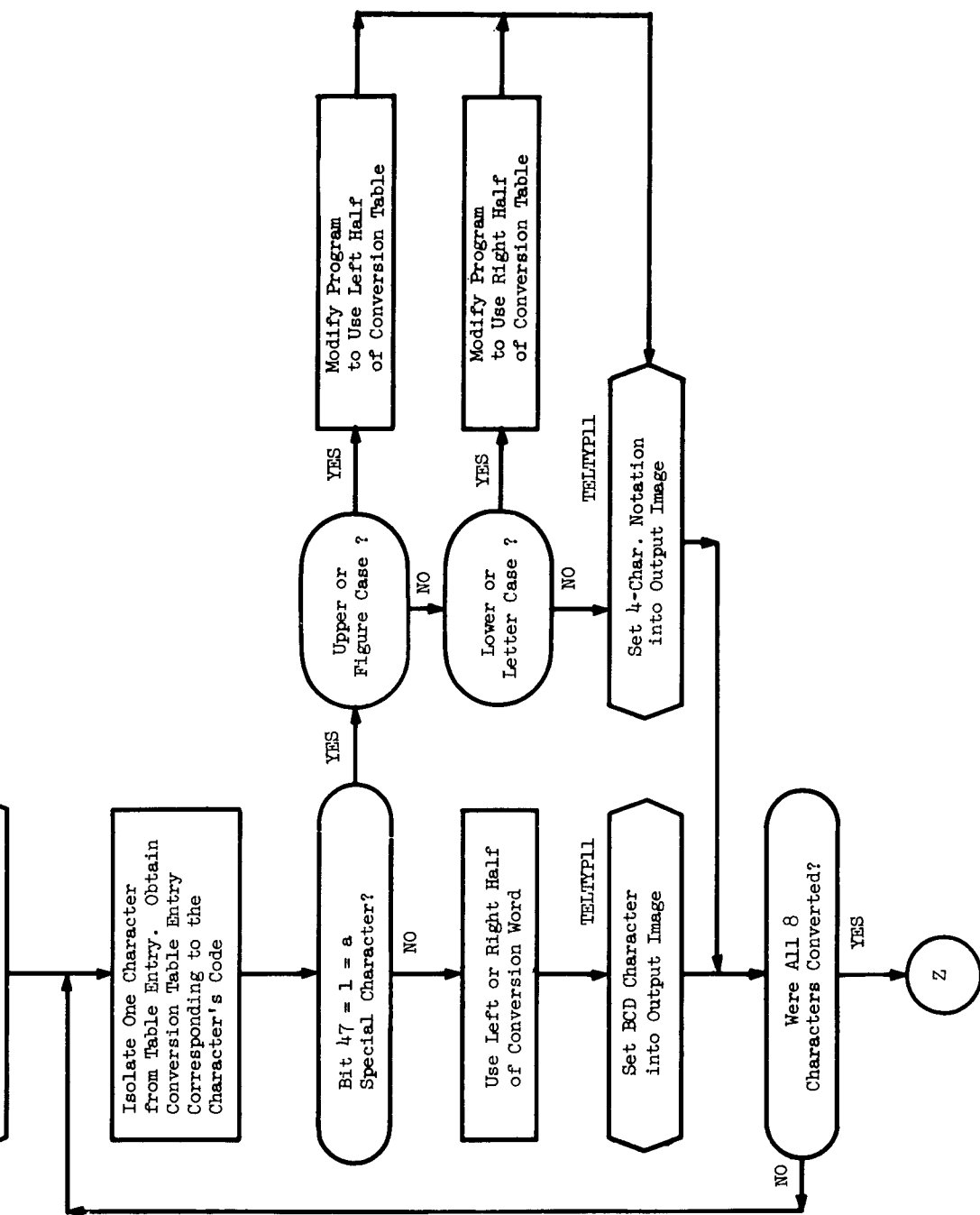
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TELETYPE

Teletype and Typewriter Code
to BCD Conversion



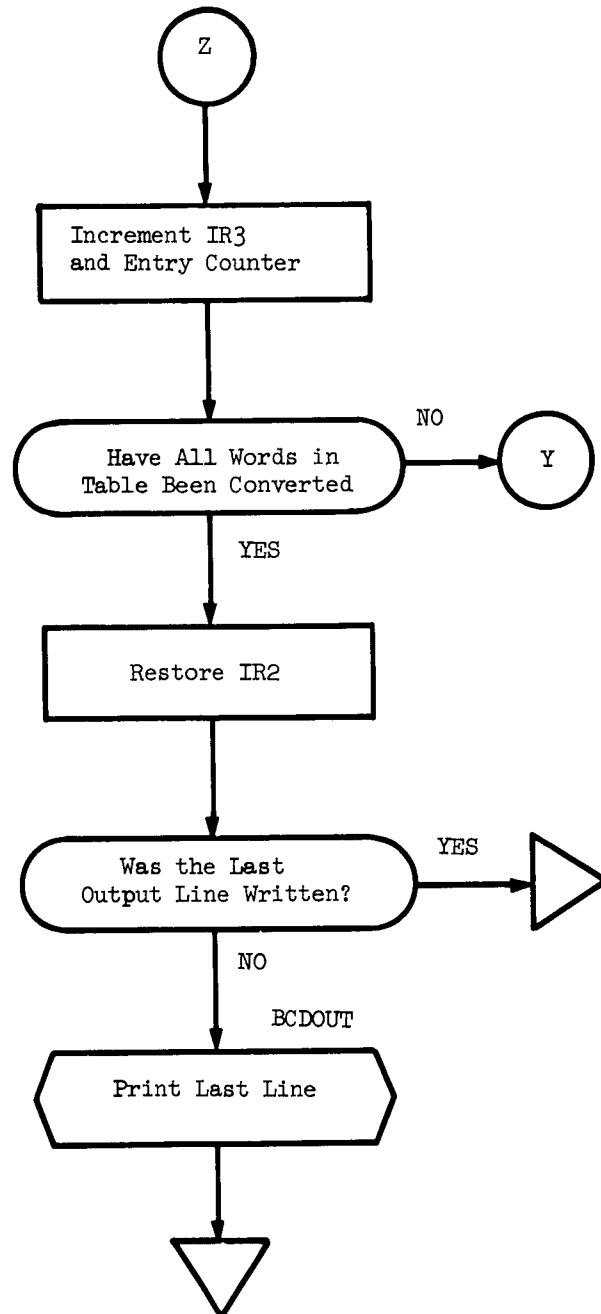


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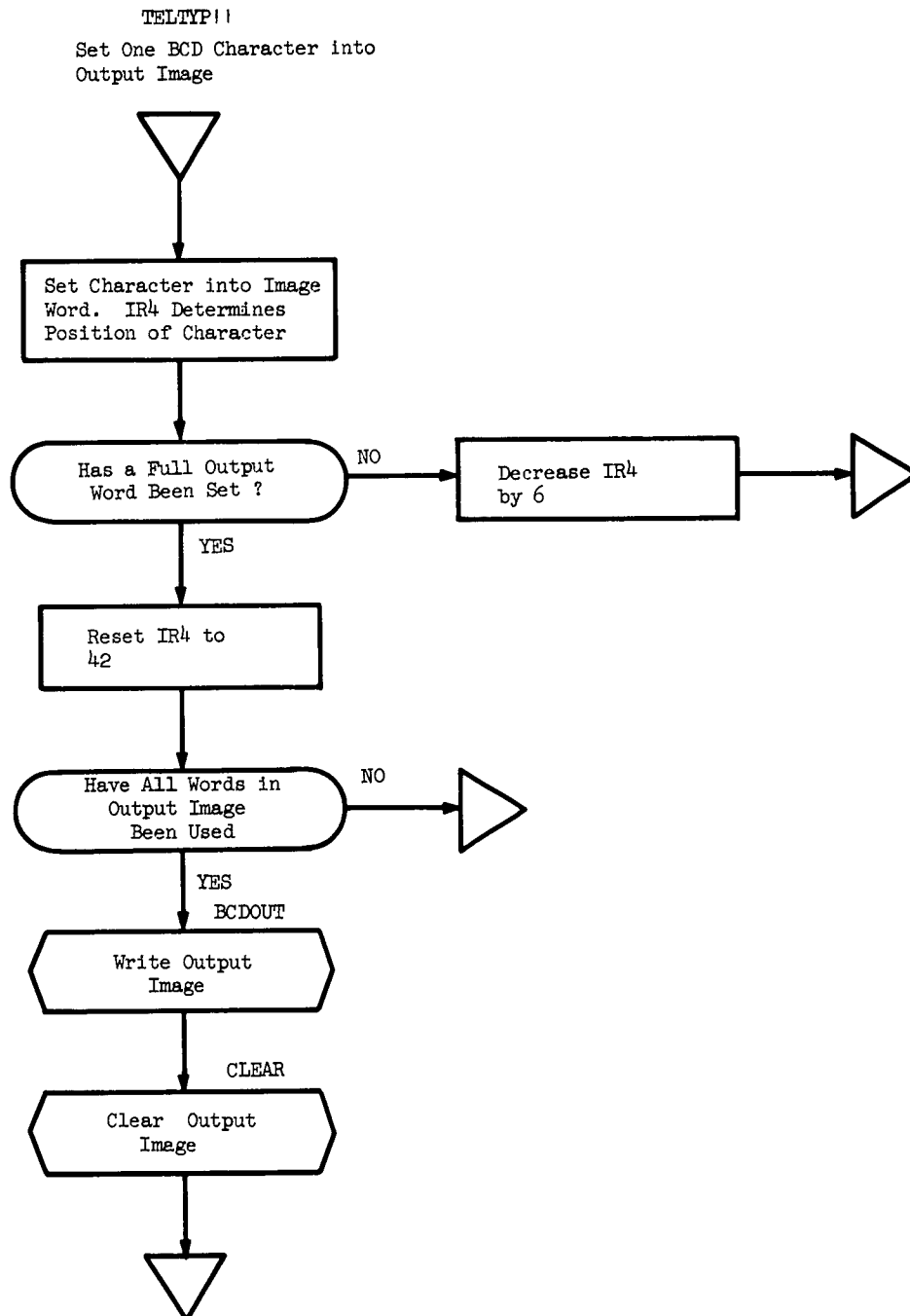
TELTYP (continued)



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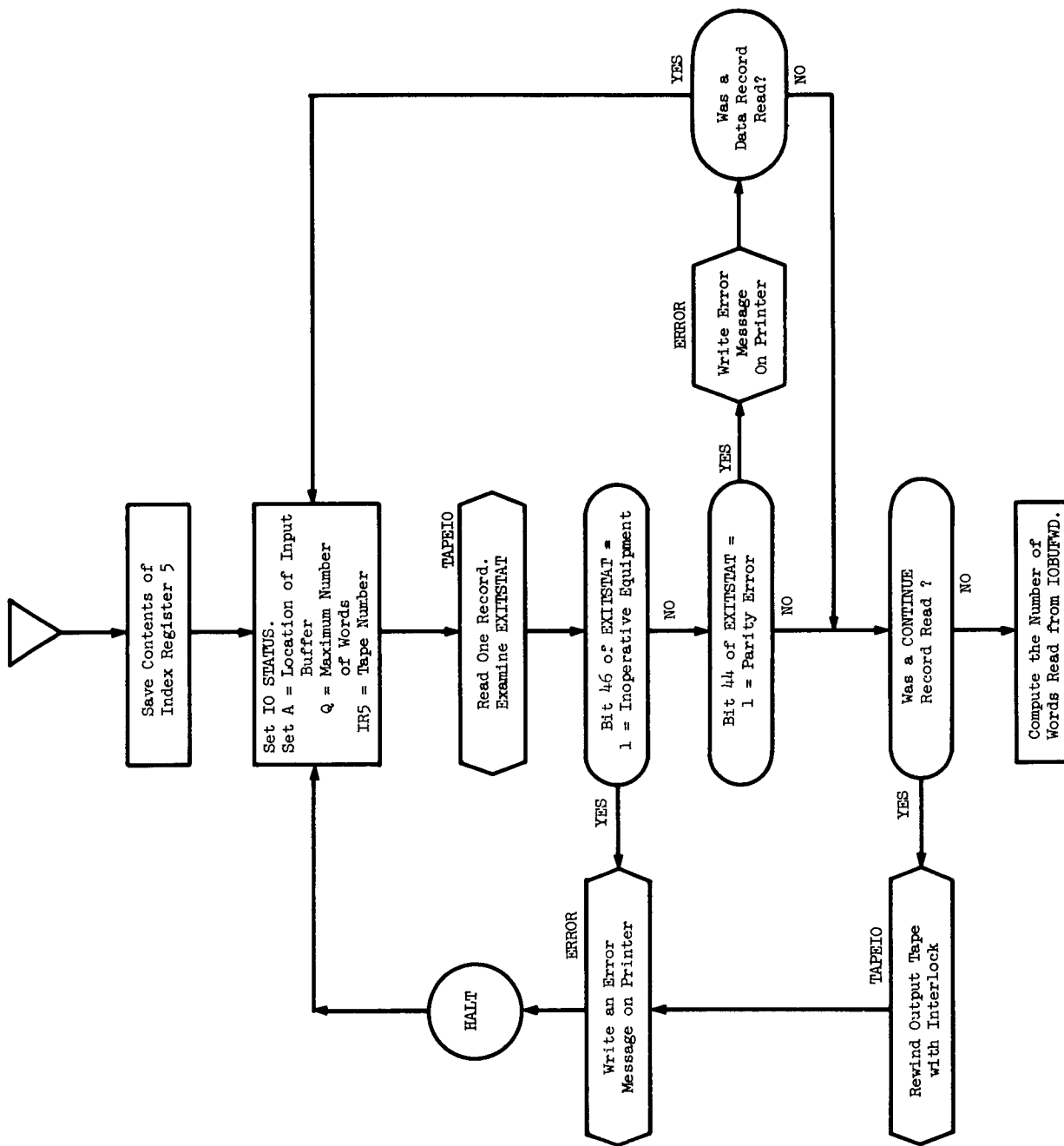
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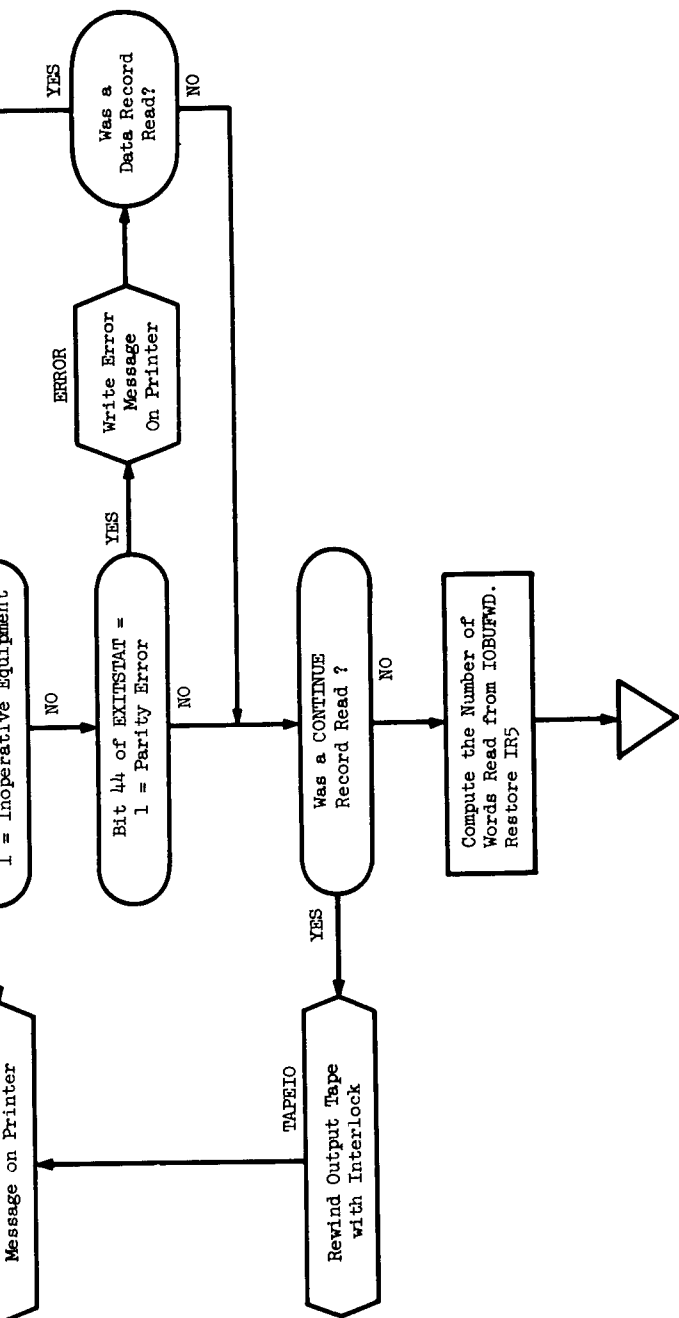
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READ

Reads One Record from the STCP Recording Tape.
Enter with A = Address of Input Buffer.





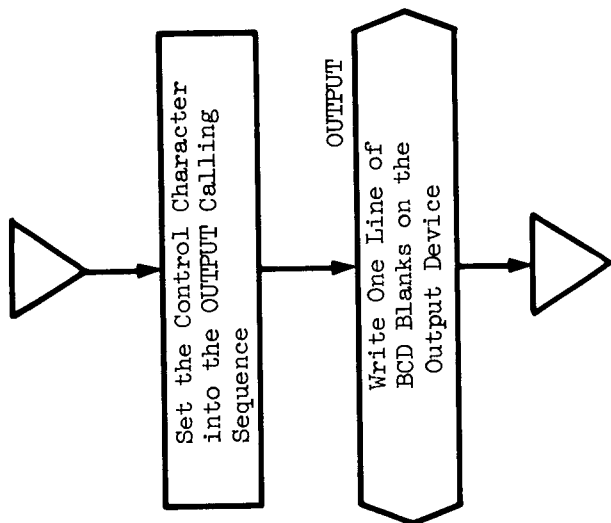
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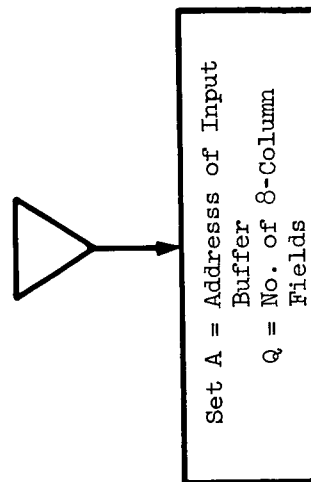
SPACE

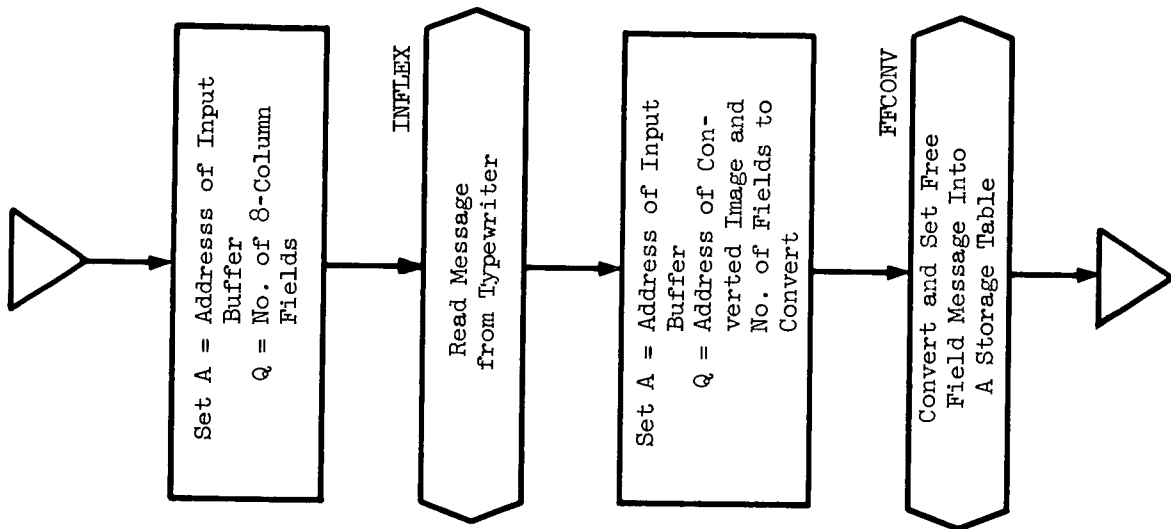
Skip a Specified Number of Lines on the Printout. Enter with the Control Character in A.



TYPE

Reads An 80-Column Message from the Console Typewriter.



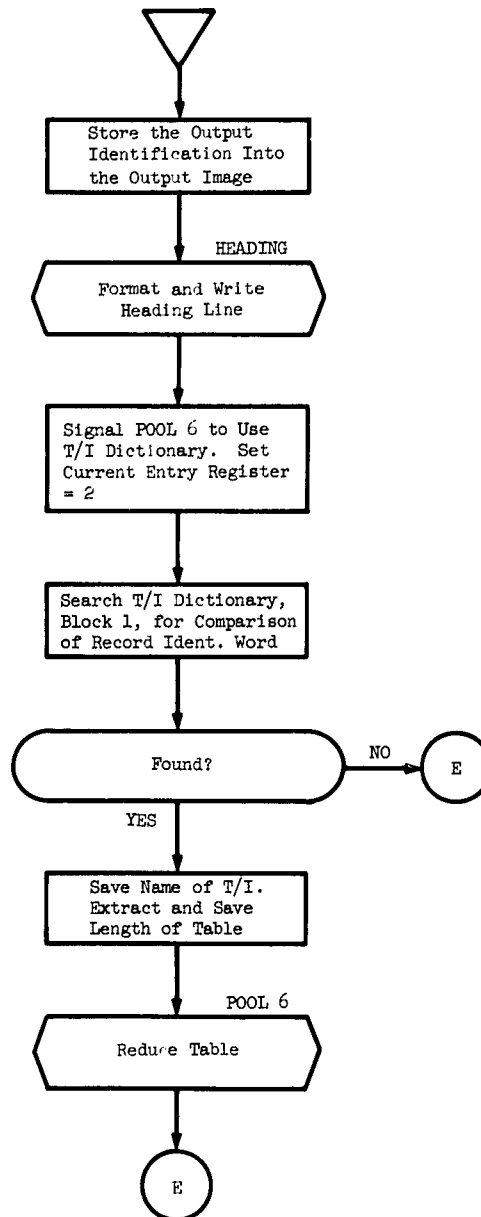


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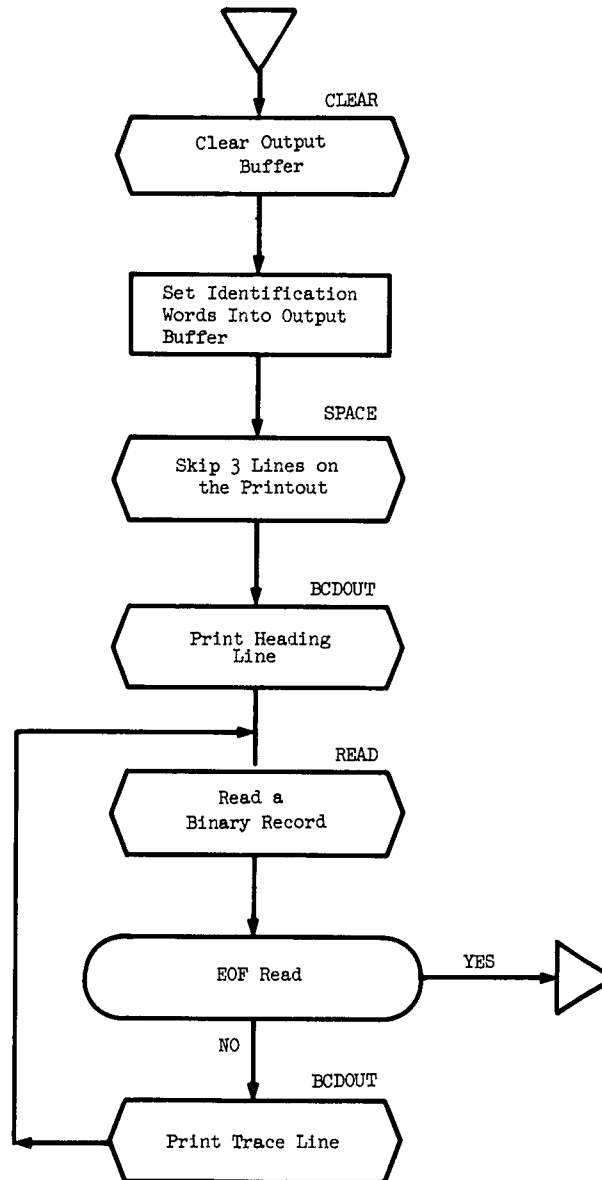
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TABLE
Reduce Table/Item Record.
This Is NOT A Closed Subroutine



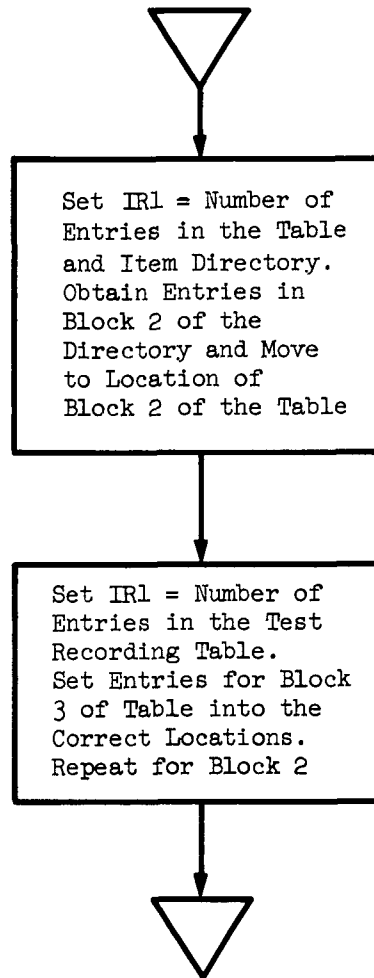
TRACE

Transfers TRACE Records from the
Binary Tape to the BCD Tape.
Enter With A = First Binary Record
Identification Word.



UNPACK

Separates Data Blocks of the Table and Item Directory and the Test Recording Table. These Blocks May Not Contain the Maximum Number of Entries and Have Been Packed into Adjacent Words On the STCP Recording Tape.



APPENDIX A
TABLE DESCRIPTIONS

1.0 Input Tape Images

1.1 ENTDATA, DATA

Variable length data records are read into table DATA. ENTDATA is an item which is set to the number of words in the record currently contained in DATA.

DATA, word 0: Record identification. Eight-character BCD word, left justified with trailing blanks.

DATA, word 1: Processing information. The contents vary with the type of record; i.e., not every recording requires all of the information for processing. Trace records do not have a "word 1" and only the initial record of a Trace group has a "word 0".

Bits 0-14: Starting core address.

 15-23: Number of records in a recording.
 Meaningful only for core dumps.

 24-38: "During" recording address.

 45: 1 = recorded "before".

 46: 1 = recorded "after".

 47: 1 = recorded "during".

1.2 Console Record

This record is read into DATA as are all other data records. Its contents, however, are in a fixed format and so are listed here. A console recording consists of a dump of various computer registers at the moment of recording.

DATA, word 2: Contents of A register

DATA, word 3: Contents of Q register

DATA, word 4: Contents of IR1 in the upper M-term and contents of
 IR2 in the lower M-term.

DATA, word 5: Contents of IR3 and IR4.

DATA, word 6: Contents of IR5 and IR6.

DATA, words 7-12: Contents of Buffer Registers 1-6.

DATA, word 13: Contents of the Computer Clock Register.

1.3 DIRECTRY

DIRECTRY contains the Table and Item Directory for the file currently being processed. Word 0 of DIRECTRY is tagged DIRECT and contains the record identification word. Word 1 contains the number of entries in each block of the table and is tagged ENTID. The directory itself consists of two parallel blocks of information. Each block has a maximum length. On the recording tape, the blocks are packed together eliminating any unused entries. The blocks are labelled TID1 and TID2, respectively.

TID1: Table or item name. Eight-character BCD word, left justified
 with trailing blanks.

TID2: Bits 0-14: Core address.
 Bits 24-38: Length of table.
 Bits 39-44: Binary scaling of data.
 Bits 45-47: Coding of data.

1 = octal
2 = floating point
3 = fixed point
4 = BCD
5 = teletype
6 = typewriter
7 = mixed

1.4 TESTABLE

TESTABLE contains the contents of the Test Recording Table for the current data file. Word 0 is tagged RECORD and contains the record identification word. Word 1 is tagged ENTTRT and contains the number of entries in each block of the table. The recording table itself consists of three parallel blocks of information. Each block has a maximum length. On the recording tape, the blocks are packed together eliminating any unused entries. The blocks are labelled TRT1, TRT2, and TRT3, respectively.

TRT1: BCD name of recording requests. Eight characters maximum, left justified with trailing blanks.

TRT2: Bits 0-11: The number of the last record signaling the end of data reduction for this "during" request.

Bits 12-23: The number of the first record with which to start data reduction on this "during" request.

Bits 24-38: The trap address for "during" recordings. Zero if not used.

Bit 45: 1 = "before" request.

Bit 46: 1 = "after" request.

Bit 47: 1 = "during" request.

TRT3: Bits 0-14: The starting address of CORE or POOL requests. Zero if not used.

Bits 24-38: The length of the recording for a CORE or a POOL request. Zero if not used.

2.0 SDRP Internal Tables

2.1 SLI1, SLI2, SLI3

As SLI messages are read, their fields are stored in the Selective Listing Input Table. This table is constructed as three parallel blocks. Its bit structure is the same as the Test Recording Table.

SLI1: Eight-character, BCD request name. Left justified with trailing blanks.

SLI2: Bits 0-11: The record number of this "during" request with which to finish data reduction.

Bits 12-23: The record number of this "during" request with which to start data reduction.

Bits 24-38: The trap address for a "during" recording request.

Bit 45: 1 = "before" recording request.

Bit 46: 1 = "after" recording request.

Bit 47: 1 = "during" recording request.

SLI3: Bits 0-14: The starting core address of a CORE or a POOL recording request.

2.2 REFLECT1, REFLECT2, REFLECT3, REFLECT4

Information on the reference pools reduced by SDRP are stored in the Reference Pool Dictionary, REFLECT. Blocks 1 and 2 contain data on the pre-Augmentation Reference Pool. Blocks 3 and 4 contain data on the Augmentation Reference Pool. Block 3 is equivalent to block 1 in content and format, and block 4 is equivalent to block 2 in content and format.

REFDICT1: Eight-character, BCD name of reference pool table or item.
Data is left justified in the word with trailing blanks.

REFDICT2: Bits 0-14: Absolute core starting address of table or item.

Bits 15-23: Length of the table. Equal to 1 if an item.

Bits 24-27: Decimal scaling.

Bits 39-44: Binary scaling.

Bits 45-47: Code specifying type of data in table or item.

1 = octal
2 = floating point
3 = fixed point
4 = BCD
5 = teletype
6 = typewriter
7 = mixed

2.3 OPCODE

This 32-register table contains the 3-letter, mnemonic representations of 1604 instructions. It is used to convert octal operation codes to their alphabetic equivalents. Each word is in BCD with two operation codes per word. The first code occupies bits 24-41. The second code occupies bits 0-17. Unused bits are filled with BCD blanks.

OPCODE is indexed by $N/2$, where N = a 6-bit octal number. The remainder determines which bits of the data word should be used. If the remainder is zero, bits 24-41 are used; if one, bits 0-17.

2.4 FLEXO, TELET

These tables contain teletype and typewriter to BCD conversion data. FLEXO is used for typewriter conversion. TELET is used for teletype conversion. Both tables are indexed by the 6-bit number currently up for conversion.

For a non-special character, the bit structure is as follows:

Bits 0-5 contain the BCD code for use when the character is to be converted in the lower or letter case.

Bits 24-29 contain the BCD code for use when the character is to be converted in the upper or figure case.

Teletype and typewriter special character codes are represented on the printout by "(LL)". For these special characters, the bit structure is as follows:

Bit 47:	1 = special character.
Bit 46:	1 = upper or figure shift special character.
Bit 45:	1 = lower or letter shift special character.
Bits 0-23:	4-character, BCD representation.

APPENDIX B

VALIDATION TEST CONTROL CARDS

1.0 Function Requests

Some of the function request cards used to validate SDRP were:

*SDRP	6	PRINTER	
*SDRP	6	3	
*SDRP	16	3	
*SDRP	6	3	CHANGE
*SDRP	10	3	CHANGE
*SDRP	10	4	CHANGE

This last card has an illegal field which was corrected successfully via the console typewriter.

2.0 SLI Cards

The first group of cards were used in various combinations to reduce the five STCP recording tapes.

RECORD ITEM1	SETUP	12	AB	2	2	No "during" output for ITEM1 in this case, since there was only one "during" record on the tape.
RECORD ITEM1	SETUP	12	AB	0	0	
RECORD ITEM2	0	13010B	BA	0	0	
RECORD ITEM3	0	13011B	BA			
RECORD ITEM4	0	13012B	AB	0	0	
RECORD ITEM5	0	13013B	AB	0	0	
RECORD ITEM6	SETUP	13	BA	0	0	
RECORD ITEM7	0	13000B	AB	3	20	
RECORD ITEM7	0	13000B	AB	5	15	
RECORD AREA1	SETUP	5	AB	0	0	
RECORD AREA1	SETUP	5	D	0	0	Illegal field 5
RECORD AREA1	SETUP	5	0	0	0	

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```
RECORD AREA2  SETUP    6  AB  0  0
RECORD AREA3  SETUP    7      0  0
RECORD AREA3  SETUP    7  AB  0  0
RECORD AREA4  SETUP    8  AB  0  0
RECORD AREA5  SETUP    9  BA  0  0
RECORD AREA6  SETUP   10  AB  0  0
RECORD AREA7  SETUP   11  BA  0  0
RECORD AREA7  0  12456B BA  0  0
RECORD AREA7  SETUP   11  0
RECORD CORE   0  13000B  0  0  0  14000B
RECORD CORE SETUP    3  AB  260B  0  14000B  0  0
RECORD POOL   0  0  A  5000B  200B  0  0
RECORD POOL SETUP    4  AB  5000B  200B
RECORD CONSOLE  0  0  AB  0  0
RECORD CONSOLE SETUP    2  AB  0  0
RECORD CONSOLE SETUP    2  0  0  0
CONSOLE SETUP    2  0                                     Illegal field 1.
```

To reduce the one file tape generated by the author, these cards were used:

```
RECORD POOLA   0  0  A  4700B  0
RECORD TESTTAB 0  47560B  0  0  0
RECORD TESTIT  0  0  A  0  0
RECORD CONSOLE 0  0  B  0  0
```

On one run, SLI messages were inserted through the typewriter.

```
RECORD POOLA   0  0  A  4700B
END
```

To reduce the multiple file tape generated by the author, the following cards were used:

```
RECORD CORE    0  0  B  0  0  17177B
```

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RECORD POOL	0	0	B	5000B	0			
RECORD TABLE	0	10016B	B	0	0			
RECORD CORE	0	27650B	0	0	0	100B	0	0
RECORD TABLE	0	11610B	0	0	0			

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22 April 1963

TM-715/040/00

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Vorhaus, A. H.	24074
Wong, J. P.	Sunnyvale
AFCPL (5)	14059

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System Development Corporation,
Santa Monica, California
UTILITY PROGRAM DESCRIPTIONS MILESTONE
11 DATA REDUCTION PROGRAM FOR THE
PARAMETER TEST SYSTEM (SDRP).
Scientific rept., TM-715/040/00,
by R. Frey. 22 April 1963, 62p.
(Contract AF 19(628)-1648, Space Systems
Division Program, for Space Systems
Division, AFSC)

Unclassified report

DESCRIPTORS: Programming (Computers).
Satellite Networks.

Reports that SDRP is the data
reduction program for the Parameter

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Test System. States that its
purpose is to format and list
on a BCD tape, or on the on-line
printer, the data from the
recording tape generated by the Test
Control Program, STCP. Also states
that all records on the tape may be
listed, or records may be selected
for listing through the use of
Selective Listing Input Messages.

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